Monthly & Final Report

to the

Committee

September 2020

From the
Court-Appointed Monitor
for
Columbia Gas of Massachusetts

Submitted October 6, 2020

Disclaimer and Limitations:

Hall & Associates, LLC submits this report to the Government Committee solely in accordance with the February 24, 2020 Plea Agreement between the U.S. Attorney for the District of Massachusetts and Bay State Gas Company d/b/a/ Columbia Gas of Massachusetts, as well as the associated Monitor Work Plan. This report does not constitute a guarantee of continued or absolute compliance by CMA with the five NTSB recommendations (and their related laws and regulations) from their investigation of the CMA pipeline accident in the Merrimack Valley on September 13, 2018, to the extent such compliance is noted in this report. This report is solely intended to provide information to the Government Committee in connection with the tasking in the Plea Agreement. This report can only be relied upon by the Government Committee and no other third party may rely upon this report, and it shall only be reproduced in its entirety.

United States v. Bay State Gas Company, d/b/a Columbia Gas of Massachusetts
(Docket: 20-cr-10066-FDS)

Monthly & Final Report of the Independent Monitor for Columbia Gas of Massachusetts
September 2020

Executive Summary

As the Court-appointed Monitor for Columbia Gas of Massachusetts, Hall & Associates LLC submits this third monthly report to the Government Committee[1] in accordance with the February 24, 2020 plea agreement between the United States Attorney for the District of Massachusetts (the "U.S. Attorney") and Bay State Gas Company d/b/a/ Columbia Gas of Massachusetts ("CMA"). As a condition of the probation sentence imposed by the Plea Agreement, CMA was required to employ an in-house monitor at its expense to oversee aspects of CMA's operations as outlined below.

Due to the expected acquisition of the gas distribution assets of CMA by Eversource Energy (per a separate condition of the Plea Agreement) and the related cessation of the Monitor's ability to continue oversight of operations that will no longer be controlled by CMA, this report has been structured as both a monthly report for September as well as a "final" report of the Monitor's work and findings to date, subject to update only if and as directed by the Court. The Monitor respectfully requests clarification from the Court as to the current status of the Monitor's oversight duties and the date on which oversight of CMA by the Monitor should end.

Pursuant to the Plea Agreement and the Monitor's Work Plan submitted to the Court, the Monitor has conducted oversight of CMA's compliance with five NTSB recommendations and their related laws and regulations issued to CMA's parent company, NiSource, Inc. ("NiSource") from the investigation of a fatal gas pipeline accident in the Merrimack Valley on September 13, 2018, as well as oversight of CMA's safety culture. The Monitor reviewed over 15,000 pages of documents that include organizational charts, procedures, interrogatory responses, safety data, training materials and industry best-practices. The Monitor also conducted 76 interviews with 47 employees (executives, managers and staff) at CMA and NiSource. The Monitor also completed 8 site visits and observed two emergency drills.

The Monitor's oversight has been impacted by a variety of restrictions and challenges. First, the goal of all interested parties was for the timeframe in which NiSource would continue to have oversight of CMA's operations -- and the duration of the Monitor's oversight -- to be as short as possible. This intentional brevity of the Monitor's appointment impacts the scope of this "final" report. Other challenges include navigating the complexities of the interrelationship between CMA and NiSource (including those resulting from the pending sale), and the restrictions and limitations resulting from the COVID-19 pandemic. Finally, as noted in the Work Plan, the Monitor's finite resources limited its ability to cover all aspects of CMA's operations. Despite these challenges, the Monitor was able to prioritize its work scope to accomplish its tasking and optimize its impact.

Summary of CMA Compliance with Recommendations and Applicable Laws and Regulations

CMA has generally complied with the intent of three of the five NTSB recommendations: **P-18-006** *(PE reviews)*; **P-18-009** *(Gas pressure monitoring)*; and **P-19-018** *(Emergency Response)*, although the Monitor believes CMA can and should obtain additional incident command leadership experience and enhance its multi-jurisdictional emergency exercises for large scale incidents in furtherance of P-19-018.

[1] The Government Committee is composed of a representative from the U.S. Attorney for the District of Massachusetts, the Massachusetts Department of Public Utilities (DPU) and the Massachusetts Attorney General's Office.

Recommendation **P-18-007** *(Documentation is traceable, etc.)* has also been accomplished by CMA, but only recently and only if compliance is determined against documentation applicable to low pressure *regulator station sensing lines*, which is a narrow scope set by NiSource and accepted by the NTSB that applies to a more limited set of records than the exact language of the recommendation (i.e. "*all records*…).

Recommendation **P-18-008** *(Management of Change)* is the fifth recommendation. The Monitor notes that a robust, mature and integrated MOC has not yet been fully implemented at CMA. The company still does not have a formalized MOC procedure as described in its SMS policy document and API Recommended Practice 1173 (*Pipeline Safety Management Systems*). The Monitor's current understanding is that while NiSource will begin the rollout of its MOC in October 2020, CMA will center its efforts on compliance with Eversource's MOC policy after it acquires CMA.

The Monitor has not identified evidence of any specific non-compliance with **laws and regulations** applicable to the NTSB recommendations as identified in the Work Plan. However, due to the limitations on the Monitor's oversight outlined above, the Monitor cannot affirmatively state that all aspects of CMA's operations are compliant with all such laws and regulations.

Summary of Assessment of CMA's Safety Culture and Safety Management Systems (SMS)

The Work Plan also requires the Monitor to assess CMA's safety culture in all areas of oversight. Safety culture is an aspect interwoven into the issues addressed in all five NTSB recommendations. The success of an SMS is directly related to the support of a positive safety culture. The Monitor has not found sufficient evidence to verify the presence of a positive safety culture at CMA. While it appears that CMA is making progress in the development of SMS capabilities specified in API Recommended Practice 1173 (*Pipeline Safety Management Systems*), this progress has been uneven and the program is still in early stages of development. The following is a summary of the Monitor's assessment of some of these SMS elements:

- *Executive Leadership and Management Commitment* - The expectations that lead to a positive safety culture are *created* at the top of the organization, not merely supported by the top. The Monitor notes that now, after two years and many reports with recommendations, some safety gaps identified from the Merrimack Valley accident have not yet been closed. Performance goals for safety have not been appropriately established or cascaded down through the workforce. The discretionary performance bonus component provided to leadership has been driven in large part by financial performance of the company rather than safety. Most employees still do not know and cannot explain CMA's Vision, Mission and Goals. However, the Monitor notes that CMA is now much more focused on improvement, and efforts by CMA's new leadership to address the identified safety concerns is encouraging.
- *Emergency Preparedness and Response* - CMA has improved its response capability since the Merrimack Valley accident by increasing emergency training exercises, providing more training and certification, defining and designating employees to staff Incident Command (IC) positions, procuring a mobile command capability, and establishing critical component inventory capability. However, an issue of concern to the Monitor relates to gaps in experience at the IC Command and Staff levels during large scale multijurisdictional incidents, especially in the early stages of such an event. Another issue of concern relates to the uncertainty of emergency response capability during the transition of CMA assets to Eversource.
- *Risk Management* - CMA has made reasonable progress in the SMS element of *Risk Management,* chiefly through its Corrective Action Program (CAP) risk assessment and management process; however, this process is not yet well integrated with CMA/NiSource's Distribution Integrity Management Program (DIMP).

Additional observations related to CMA's safety culture that have already been reported out in the Monitor's previous two Monthly Reports and are summarized below as follows:

- Accountability: Documents and standards do not adequately support the effective application of the terms and concepts regarding accountability, responsibility, authority and the consequences associated with them. Survey results and self-assessment data indicate that the workforce is unclear about what accountability means – to whom and for what.
- Safety Performance Measurements. CMA safety metrics for past accidents and injuries (i.e. "lagging" metrics) have improved substantially in 2020 as compared to 2018 and 2019 when the company was largely in the third quartile (i.e. lower half) in comparison with the industry. CMA's use of "forward looking" safety indicators is in its early stages and will require much more validation and experience to be of value to improve safety.

Conclusions and Perspectives of the Monitor

- After two years and many reports with recommendations related to the safety lapses that led to the Merrimack Valley accident, CMA has yet to close all of the identified safety gaps. However, the Monitor notes that CMA is now much more focused on improvement, and efforts by CMA's new leadership to address the identified safety concerns is encouraging.

- The Monitor's obligations were limited to oversight of CMA as per the Plea Agreement and Work Plan. In the performance of this oversight, the Monitor's report shows that certain safety deficiencies exist at CMA as a result of the governance by the parent company.

- The responsibility for overseeing the day-to-day operations of CMA rests with the Massachusetts Department of Public Utilities (DPU), and this oversight -- not the Monitor's oversight -- will remain after the acquisition of CMA. It is the Monitor's hope that the DPU will reference the Monitor's work to inform its safety oversight of CMA and any successor owner/operator of CMA's gas distribution assets, including if and as acquired by Eversource Energy.

- Safety costs a lot of money. Money is required for salaries of safety professionals, training programs, emergency supplies, safety equipment, and incentives for executives and staff to meet safety goals. In the case of the Merrimack Valley accident, NiSource/CMA has paid well in excess of $1 billion for restitution for injury or loss of human life and property damage, restoration costs, fines, penalties, litigation, and compliance requirements. This figure does not include the indirect costs of committing significant internal resources to address the aftermath of an accident as well as a loss of goodwill.

- Based on the Court's recent orders, it is the Monitor's understanding that the Monitor's authority will be terminated upon the completion of the forthcoming sale of CMA (specifically the approval by the Court of the Final Sale Certification), but as above, the Monitor requests clarification from the Court as to the scope of any oversight responsibilities after September 30, 2020, as to whether any ongoing oversight is still needed or required to further effectuate the goals of the Plea Agreement.

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Monthly & Final Report
of the
Court-Appointed Monitor
for Columbia Gas of Massachusetts (CMA)

---- September 2020 ----

1.0 Introduction

As the Court-appointed Monitor for Columbia Gas of Massachusetts ("CMA"), Hall & Associates, LLC submits this third monthly report to the Government Committee[2] in accordance with the February 24, 2020 plea agreement between the United States Attorney for the District of Massachusetts (the "U.S. Attorney") and Bay State Gas Company d/b/a/ Columbia Gas of Massachusetts. As a condition of the probation sentence imposed by the Plea Agreement, CMA is required to employ an in-house monitor at its expense to oversee specific aspects of CMA's operations as outlined below in Section 2.2.

Due to the expected acquisition of the gas distribution assets of CMA by Eversource Energy (per a separate condition of the Plea Agreement) and the related cessation of the Monitor's ability to continue oversight of operations that will no longer be controlled by CMA, this report has been structured as both a monthly report for September as well as a "final" report of the Monitor's work and findings to date, subject to update only if and as directed by the Court. The Monitor respectfully requests clarification from the Court as to the current status of the Monitor's oversight duties and the date on which oversight of CMA by the Monitor should end.

2.0 Background

2.1 Merrimack Valley Accident and Aftermath

On September 13, 2018, a series of structure fires and explosions occurred after high-pressure natural gas was released into a low-pressure natural gas distribution system in the northeast region of the Merrimack Valley in the Commonwealth of Massachusetts ("Merrimack Valley accident"). One person was killed, 22 were injured and131 structures were damaged in the city of Lawrence and the towns of Andover and North Andover. The natural gas distribution system is owned and operated by Columbia Gas of Massachusetts (CMA), a subsidiary of NiSource, Inc.

The National Transportation Safety Board (NTSB) investigated the accident and issued recommendations and a final report.[3] The NTSB issued a total of five recommendations to CMA's parent company NiSource during the investigation. The first four recommendations were issued on November 15, 2018 -- two months after the Merrimack Valley accident -- and were classified as "urgent". These four recommendations have since been classified by the NTSB as "Closed – Acceptable Action". The fifth and final recommendation was issued to NiSource during the adoption of the NTSB's final accident report on September 24, 2019. This recommendation addresses emergency response and is currently classified as "Open-Acceptable Response". The

[2] The committee composed of a representative from the U.S. Attorney, the Massachusetts Department of Public Utilities (DPU) and the Massachusetts Attorney General's Office.

[3] NTSB Pipeline Accident Report NTSB/PAR-19/02, *"Overpressurization of Natural Gas Distribution System, Explosions, and Fires in Merrimack Valley, Massachusetts, September 13, 2018."* Adopted September 24, 2019. https://www.ntsb.gov/investigations/AccidentReports/Reports/PAR1902.pdf

Monitor team's work and observations to date regarding each of the five recommendations – as applied to CMA rather than NiSource -- is presented in Section 4.0 of this report.

Additionally, following the Merrimack Valley accident, the U.S. Attorney for the District of Massachusetts pursued criminal charges against CMA. The company agreed to plead guilty to violating a minimum safety standard of the *Natural Gas Pipeline Safety Act* relating to the failure to implement procedures to prevent the over-pressurization. CMA also agreed to accept responsibility for the accident.

2.2 Monitor's Scope of Work

The U.S. Attorney entered into a Plea Agreement with CMA on February 25, 2020, which, among other things, requires CMA to employ at its expense an independent monitor to oversee its compliance with five NTSB recommendations issued from the Merrimack Valley investigation and also to monitor compliance with the "applicable laws and regulations" related to the issues addressed in the recommendations.[4]

The Plea Agreement requires the Monitor to report monthly in writing to a government committee ("Committee") composed of representatives of the U.S. Attorney's Office, the Massachusetts Department of Public Utilities (DPU), and the Massachusetts Attorney General's Office. The Monitor's tasking is required during a three-year probation period subject to earlier termination upon the Court's approval of the Final Sale Certification upon the closing of the sale of the CMA assets by NiSource. As a part of the Plea Agreement, NiSource agreed to use reasonable efforts to sell the assets of CMA to another company, and pursuant to this requirement, entered into an asset purchase agreement[5] that contemplates the sale by October 26, 2020, subject to extension for up to 90 days under certain circumstances.

In late April of 2020, CMA requested Hall & Associates LLC (see Appendix A for biographies) to begin its monitoring duties in advance of, and in preparation for, the execution of a Monitor Agreement between Hall & Associates LLC and CMA. The Monitor Agreement was reviewed and approved by the U.S. Attorney and fully executed on May 26, 2020. The Agreement required the Monitor to develop a work plan within 30 days that would govern the manner in which its oversight would occur. The Court approved the Monitor during a CMA sentencing hearing on June 23, 2020. On June 26, 2020, the Monitor submitted its first Semiannual Work Plan to the Court.

As per the Monitor Agreement, the Monitor team consulted with the U.S. Attorney's Office who in turn relied on expertise from the Pipeline Safety Division of the Massachusetts DPU. During those consultations, four suggested areas for the Monitor's examination were conveyed: Process Safety, Compliance with CMA Procedures, Field Oversight and Damage Prevention. The Monitor has incorporated these four areas into its Work Plan as they align with the Monitor's role in overseeing CMA's compliance with the NTSB's recommendations.

Pursuant to the Work Plan, the Monitor also agreed to assess CMA's safety culture in all areas of the Monitor's compliance work. The NTSB's final report of the Merrimack Valley accident addressed

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[4] The applicable Federal statute and the applicable rules derived from it are enforced by the Pipeline and Hazardous Materials Safety Administration (PHMSA). Their titles are: (1) U.S. Code Title 49–TRANSPORTATION; Subtitle VII – PIPELINES; Chapter 601 SAFETY; Section 60118-Compliance and Waivers; and (2) 49 Code of Federal Regulations Part 192 *Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards.* The applicable Massachusetts regulations are (1) 220 Code of Massachusetts Regulations 101.00: Massachusetts Natural Gas Pipeline Safety Code; and (2) 220 Code of Massachusetts Regulations 107.00: Abandonment of Gas Service Lines and Leakage Survey Procedures. These regulations are enforced by Massachusetts Department of Public Utilities (DPU).

[5] *Asset Purchase Agreement By and Among NiSource, Inc.,Bay State Gas Company and Eversource Energy.* Feb.26, 2020.

the importance of safety culture in pipeline operations. This sentiment was supported and reiterated by all parties involved in the Plea Agreement. The Monitor team's work and observations regarding Safety Culture and SMS are presented in Section 5.0 of this report.

The Monitor notes that the NTSB issued its recommendations to NiSource; however, the Court, through the Plea Agreement, instructed the Monitor to focus on CMA's compliance with the NTSB recommendations, and not to issue recommendations to NiSource.[6] This situation has presented a challenge to the Monitor because CMA's compliance and leadership remains intertwined with NiSource management policies and executive directives. The Monitor team has required additional time to sort out the structure and impact of this relationship.

Additionally, because the Monitor's authority and tasking is to be terminated upon the closing of the expected sale of the assets of CMA to Eversource Energy, opportunities to conduct its work have been limited by time as well as operational restrictions due to the COVID-19 pandemic. It has been infeasible for the Monitor to review all work and every policy and procedure CMA executes throughout its operations on a daily basis. Despite these challenges, the Monitor was able to prioritize its work scope to accomplish its tasking and optimize its impact.

The Monitor's activities have occurred in a challenging environment. The COVID-19 pandemic and government issued stop-work orders have resulted in a significant reduction of customer-facing and non-essential work for CMA. These factors have combined to significantly reduce the Monitor's opportunities to observe and monitor CMA work, and to communicate directly with their workforce. To date, all documents and queries have been managed electronically and most interviews have been conducted via videoconferencing. Despite these challenges, the Monitor team has been effective in identifying CMA activities and programs to observe and audit.

The Monitor notes that the responsibility for overseeing the day-to-day operations of CMA rests with the Massachusetts DPU, which is responsible for the oversight of investor-owned electric power, natural gas, and water utilities in Massachusetts. The mission of the DPU is to ensure that customers of the covered utilities receive reliable and economical service, along with protecting the public from natural gas pipeline-related accidents and ensuring that residential ratepayers' rights are protected. The Pipeline Safety Division of the DPU is an enforcement office, ensuring that operators of natural gas distribution companies and other intrastate utility operators are following state and federal regulations governing safety.

2.3 Columbia Gas of Massachusetts: A Company in Transition

The roots of CMA reach back to the first half of the 19th century when the company began as the Springfield Gas Light Company in Springfield, Massachusetts in February 1847 by three businessmen who began building streetlamps on Main Street. Following the invention of the light bulb, the company began to offer gas heating in 1916. In 1974, the Springfield Gas Light Company became Bay State Gas after merging with the Brockton Taunton Gas Company, Northampton Gas Light Company and Lawrence Gas Company. In December 1997, during a period of industry deregulation, Bay State Gas merged with the Northern Indiana Public Service Company (NIPSCO) but kept its name. Shortly thereafter, NIPSCO became NiSource. In 2008, Bay State Gas' operations in New Hampshire and Maine were sold to the Unitil Corporation. In 2010,

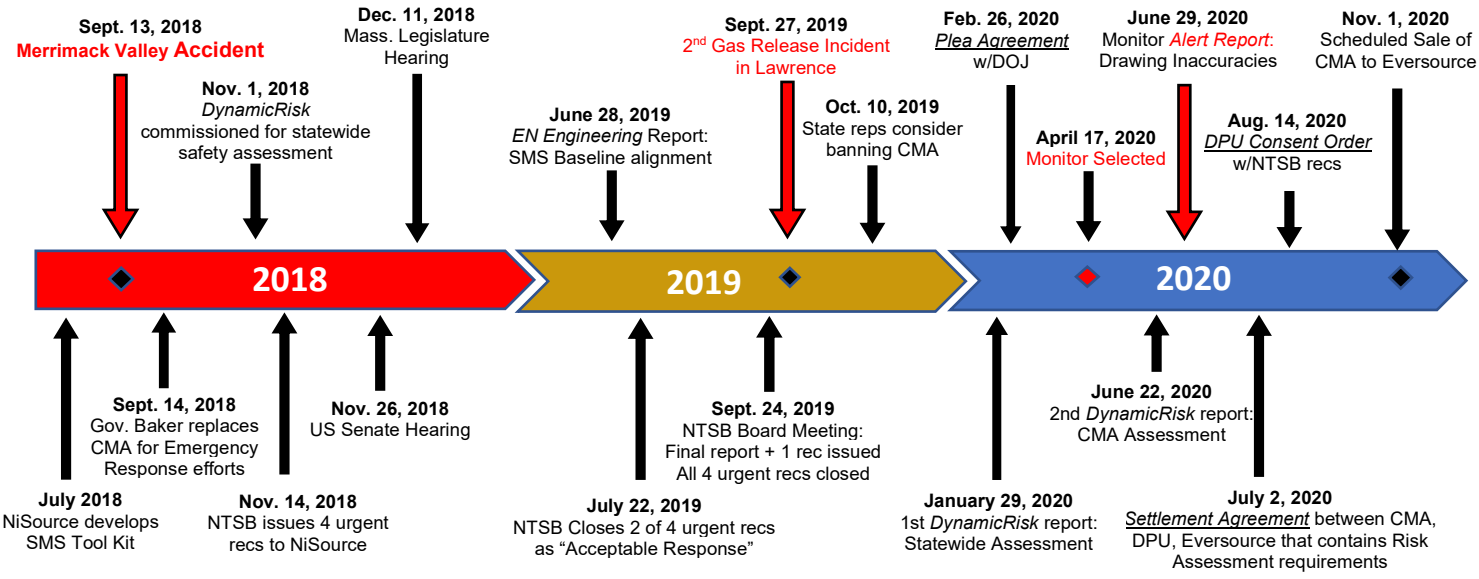
[6] According to a separate deferred prosecution agreement, NiSource *"also agrees that its subsidiaries involved in the distribution of gas through pipeline facilities in Massachusetts, Indiana, Ohio, Pennsylvania, Maryland, Kentucky and Virginia to implement and adhere to each of the [five NTSB] recommendations…"* and that it would be subject to prosecution if it failed to *"perform or fulfill each of NiSource's obligations under this Agreement."* However, NiSource is not subject to an independent Monitor.

NiSource changed "Bay State Gas Company" to "Columbia Gas of Massachusetts" in order to bring it into conformity with NiSource's five other Columbia Gas affiliates.

Today, CMA employs about 850 people and delivers natural gas to over 320,000 customers in southeastern Massachusetts, the greater Springfield area and the Merrimack Valley. Headquartered in Westborough, Massachusetts, the company is the largest gas-only provider in the state. Currently, CMA is still owned by NiSource, Inc., an Indiana-based company which controls six gas distribution subsidiaries that provide natural gas under the Columbia Gas brand to about 2.6 million customers in Kentucky, Maryland, Massachusetts, Ohio, Pennsylvania and Virginia.[7]

CMA is currently experiencing a significant amount of change and uncertainty that the Monitor team believes has the potential to increase its exposure to risk. This change began with the Merrimack Valley accident in September 2018 and continued through the accident's aftermath of Congressional hearings, increased media coverage, Federal and state investigations, criminal prosecution, DPU work stoppages, the COVID-19 pandemic and the assignment of a monitor. As a result of the Merrimack Valley accident and the subsequent gas release incident that occurred in Lawrence one year later[8], CMA and NiSource were scrutinized by state and federal agencies and independent consulting firms. Cumulatively, these entities issued over 50 recommendations to CMA – directly or indirectly – with the purpose of closing numerous safety gaps that were identified. The governor and some representatives of Commonwealth of Massachusetts legislature called for the replacement of CMA with another company. A graphical representation of relevant events that have occurred since the Merrimack Valley accident is presented below:

Post-Accident Timeline of Relevant Events Related to CMA Operations



[7] NiSource has a total of approximately 8,000 employees. Its principal subsidiaries include a natural gas distribution holding company as well as a separate gas and electric company. NiSource's natural gas operations comprise about 60,000 miles of pipeline and include 732 low-pressure natural gas distribution systems across its seven-state footprint.

[8] In the early morning of Friday, September 27, 2019, while conducting a check of water valves, contractors working for the City of Lawrence inadvertently closed a legacy gas valve that was connected to an abandoned gas main. The abandoned gas main had within it an inserted, active gas main. The turning of the legacy valve sheared the active inserted main. Valves to shut down the gas flow were closed two hours after notification of an odor of gas at a manhole cover (which was confirmed). The affected area of 150 homes was evacuated for about 18 hours, at which time gas service was restored.

2.4 The Bridge of Compliance

CMA and NiSource are currently operating under an organizational structure that is essentially the same as what existed when the Merrimack Valley accident occurred. However, as cited previously, control of CMA assets is likely to be transitioning away from NiSource's control to Eversource Energy as a result of certain requirements of the Plea Agreement. The Monitor recognizes that NiSource – as CMA's current parent – remains responsible for ensuring CMA's safety until the Sale to Eversource is completed.

Under the terms of the Plea Agreement, Eversource Energy will acquire substantially all of the assets of CMA and its affiliates that primarily relate to the business of storing, distributing or transporting natural gas to residential, commercial and industrial customers in Massachusetts (the "CMA Assets") with the CMA Assets subsequently operated by a subsidiary of Eversource, Eversource Gas of Massachusetts (EGMA). EGMA also agreed to assume certain liabilities of CMA and its affiliates. Eversource Energy is New England's largest energy delivery company serving approximately 4 million customers in Connecticut, Massachusetts and New Hampshire. Once it acquires the assets of CMA, Eversource/EGMA will serve 626,000 natural gas customers in Massachusetts alone across more than 60 communities.

To facilitate this transfer, on July 2, 2020, CMA/NiSource, along with Eversource Energy, the Massachusetts Attorney General's Office, the Massachusetts Department of Energy Resources, and the Low-Income Weatherization and Fuel Assistance Program Network executed a 156-page Joint Petition/Settlement Agreement. Section 2.2 of the document establishes Eversource's commitment to conduct a *"Comprehensive Safety Assessment and Implementation Plan"* to thoroughly evaluate the safety and condition of the EGMA system following the closing of the sale. According to the document, the Safety Assessment *"will accomplish the thorough investigation, evaluation and review of all aspects of EGMA's operation…"*[9] The first of six appendices attached to the Joint Petition/Settlement Agreement contain the 13-page safety assessment (provided in Appendix C) and lists 32 "areas of focus" related to safety that EGMA must complete within the next 6 to 15 months, depending on the complexity of the task.

The Monitor notes that one of the areas of focus cited on page 12 of the Safety Assessment is entitled: *"Procedures and Standards, NTSB Recommendations"* and states that EGMA will perform a *"review and compare of NiSource procedures and standards to Eversource's counterpart"* and *"validate that NTSB recommendations are addressed,"* and *"assess whether MOC procedures contain prescriptive and clear requirements in the MOC beyond the NTSB recommendations."* The document cites the specific types of work products that will be required for DPU review, and it states that the estimated time for EGMA to complete this task is 6 to 9 months.[10]

Additionally, on August 14, 2020, the DPU issued a Consent Order entitled *"Compliance Agreement between CMA and DPU."* This agreement requires that CMA, by September 30, *"provide documentation to the DPU to show it has complied with Items 1-8,"* the first five of which

[9] The document specifically states that Safety Assessment will include: "*gas supply, … gate stations and district regulators, pipeline safety practices, standards and procedures, leak surveys and preventive maintenance, training and operator qualification practices, engineering and design, construction, leak management, safety management systems, integrity of maps, records and operating data, gas operations tooling and safety equipment, meters, compliance work backlog and safety culture practices.*"

[10] In the July 2, 2020 testimony of William J. Akley, President of Eversource Gas, which is attached to the Settlement Agreement, the following information was provided: In late April 2020, Eversource engaged TRC Companies, Inc. ("TRC") to assist in conducting assessments in several operational areas associated with the integration of CMA's operating assets into Eversource's local gas operations. Eversource and TRC have defined an initial scope of work in three segments: Maps and Records assessment; Standards and Procedure review; and SMS assessment.

are the five NTSB recommendations from the Merrimack Valley accident.[11] The Monitor notes that CMA recently provided its response to the DPU regarding the first five items. The agreement also stipulates other required tasks for CMA to complete under varying deadlines.

The following graphic summarizes the two separate taskings cited above for CMA and EGMA compliance as they relate to the NTSB safety recommendations in comparison to the Monitor's tasking:

Monitor Agreement *(dated May 27, 2020)*	**Settlement Agreement w/Eversource** *(dated July 2, 2020)*	**DPU Consent Order 19-140** *(dated August 14, 2020)*
The Monitor ***"shall oversee CMA's compliance with the NTSB recommendations related to…"*** the agency's Merrimack Valley Investigation.	Eversource is tasked to ***"validate that NTSB recommendations are addressed"*** and determine ***"whether MOC procedures contain prescriptive and clear requirements in the MOC beyond the NTSB recommendations."***	CMA agrees to ***"provide documentation to the DPU to show it has complied with Items 1-8."*** *The first five items listed are the five NTSB recommendations.*
Duration: Until the sale of CMA	*Estimated Completion:* 6-9 months	*Deadline:* September 30, 2020

As stated previously, the Monitor is also aware that the DPU's Pipeline Safety Division is responsible for overseeing the day-to-day gas operations of CMA's assets and employees in Massachusetts regardless of which parent company controls them. They represent the ratepayers of Massachusetts in ensuring that natural gas companies and other utilities meet their required responsibilities for safety. The Monitor and his team interviewed the current division director who was hired one year after the Merrimack Valley accident. He has 25 years of experience with the gas and energy industry in the Northeast U.S.

According to the director, the staffing the Pipeline Safety Division included only five inspectors to oversee all gas companies in Massachusetts, not just CMA, at the time of the Merrimack Valley accident. He said that significant hiring occurred at the DPU following the Merrimack Valley accident and the total number of employees in the division is now 3 times what it was before the accident and there are now 19 inspectors, 5 of whom provide oversight of CMA operations. The Monitor recognizes the benefits of this substantial increase in inspector staffing as well as the importance of the division's work in providing safety oversight.

2.5 Context for September Monthly Report and "Final" Report

As stated above, this report is being submitted as the Monitor's monthly report for September 2020; however, based on the events and circumstances outlined below that impact the duration of the Monitor's appointment, the Monitor also submits this report as its "final" report, subject to update only if and as directed by the Court. The Monitor also respectfully requests clarification from the Court as to the current status of the Monitor's oversight duties and the date on which oversight of CMA by the Monitor should end.

Among other things, the Plea Agreement requires NiSource to use reasonable best efforts to sell either CMA or its gas distribution business to a qualified third-party buyer (the "Sale Condition"). As a result of the Sale Condition, on February 26, 2020, NiSource and CMA entered into an Asset Purchase Agreement (the "APA") with Eversource Energy, a Massachusetts voluntary association ("Eversource") under which NiSource and CMA agreed to sell to Eversource, with certain additions and exceptions, substantially all of the assets of CMA and related assets (all of the assets being

[11] The DPU agreement also states that CMA *"agrees to take the … actions within the specified time …"* and that *"failure to comply with the terms of this Order may result in the assessment of civil penalties and referral of this matter to the Attorney General for appropriate action."*

sold to, and liabilities to be assumed by Eversource pursuant to the APA, the CMA Assets and such transaction, the "Sale").

The Plea Agreement also provides that if the Sale closes prior to the end of the 1-year mandatory probation period, the probation would no longer be subject to the condition of oversight by a monitor upon approval of the Court of the Final Sale Certification to be filed by CMA—because, the Court notes, at that point CMA would no longer be the legal owner of its previous gas distribution assets.

While the U.S. Attorney's claims against CMA were resolved by the Plea Agreement (and those against NiSource by a separate Deferred Prosecution Agreement), the Eversource APA further conditions the closing of the Sale on the receipt of both necessary approvals from the DPU and the existence of DPU Required Resolution on or before September 30, 2020.[12]

The Monitor is aware that the DPU Required Resolution was achieved through a July 2, 2020 Settlement Agreement among CMA, NiSource, Eversource, Eversource Gas Company of Massachusetts and the Massachusetts Attorney General's Office and a resulting Consent Order[13], based on which the closing of the Sale is now anticipated to occur by Nov. 1, 2020.

It appears more than likely that a closing of the Sale and related filing of the Final Sale Certification for Court approval will occur in the next 30 days, and while the Work Plan contemplated the continuation of oversight in October 2020 if CMA still controlled the CMA Assets, based on the current environment, the Monitor believes that continued oversight pursuant to the Work Plan may only interfere with the expedient closing of the Sale resulting from the Sale Condition.

Additionally, while the scope of the Monitor's obligations are limited to reporting to the Committee the results of the oversight required by the Plea Agreement and Work Plan -- and while the Monitor urges the DPU, NiSource and Eversource to carefully consider the findings and consultations of this report -- the overlap between the scope and goals of the Monitor's oversight with the parallel actions of the DPU, CMA, NiSource and Eversource relative to the NTSB recommendations in connection with the Consent Order and potential Sale puts into further question the benefit of any additional or future oversight by the Monitor, as separate oversight might negatively impact the most prompt and effectual achievement of the goals specified by the DPU in the Consent Order.

Finally, the Monitor has fulfilled its obligations with respect to the Court-ordered oversight in filing this report and any supplemental report requested by the Court, and the Monitor is not liable for the manner in which its reports are subsequently used by any people or entities, including governmental entities. Without limitation of the foregoing and pursuant to the Work Plan, the actions of the Monitor and its findings shall not be used in any manner to support any enforcement action contemplated by the Commonwealth of Massachusetts or its agencies, or otherwise.

3.0 Activities Conducted by the Monitor

3.1 CMA Documents and External Reports Reviewed

During this reporting period, the Monitor submitted four bulk requests for documents and interrogatories, and received 132 files and over 1,800 pages of documents. The majority of this

[12] Defined by the APA as final resolution or termination of all pending actions, claims and investigations, lawsuits or other legal or administrative proceedings against CMA and its affiliates under the jurisdiction of the DPU and all future actions, claims and investigations, lawsuits or other legal or administrative proceedings against NiSource, CMA and other affiliates relating to the Greater Lawrence Incident under the jurisdiction of the DPU, each as determined by NiSource in its reasonable discretion.

[13] August 14, 2020 Consent Order between CMA and the Pipeline Safety Division of the Department of Public Utility.

information was focused on detailed records associated with the five projects discussed in the following section that the Monitor reviewed this month as part of its validation efforts.

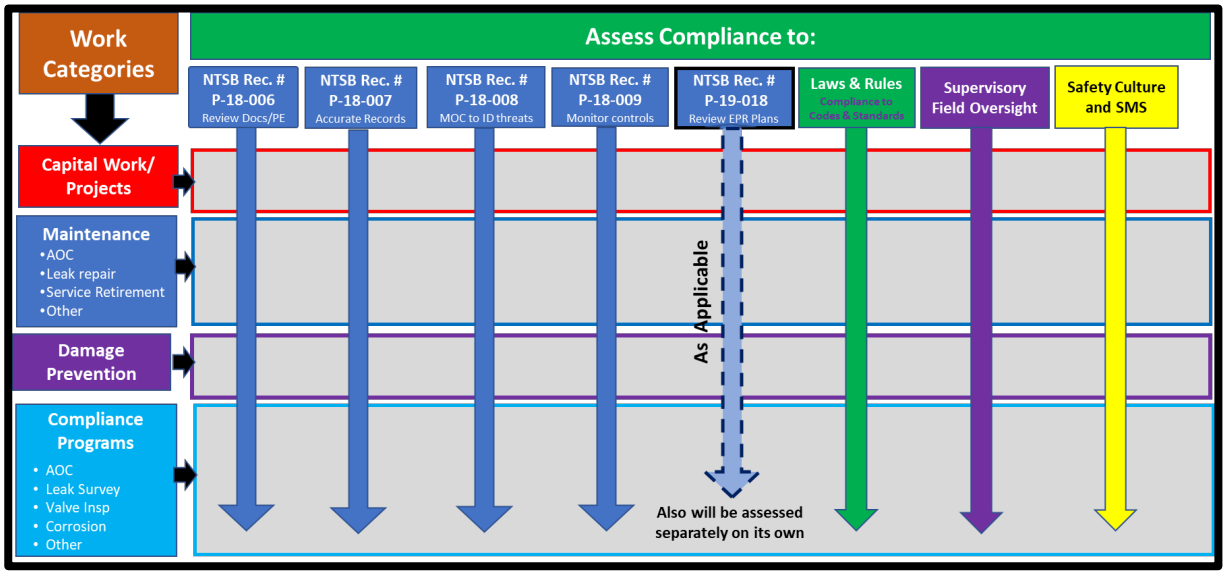
Since the Monitor began its engagement six months ago, it has submitted 19 bulk requests for documents and received over 800 files totaling nearly 15,000 pages. Additionally, as cited in its previous monthly reports, the Monitor team reviewed numerous internal and external studies, reports and agreements that were directly related to, or prompted by, the Merrimack Valley accident. The following is a partial list of 11 pertinent reports reviewed by the Monitor and his team (listed in chronological order of the date of issuance):

1. **NTSB Safety Recommendation Report Number PSR-18-02** – On November 14, 2018, the NTSB provided information from the Merrimack Valley Accident and issued four "urgent" recommendations to NiSource.
2. **National Safety Council (NSC) Safety Management System Assessment** - On March 7, 2019, the National Safety Council issued a 20-page report with the summary of a "safety culture assessment pilot of NiSource." The purpose of this assessment was to evaluate the effectiveness of the organization's current SMS. Nine "opportunities for improvement" were suggested in the report.
3. **EN Engineering PSMS Baseline Alignment Report** – June 28, 2019. This 33-page report summarizes the baseline alignment review of CMA against the API Recommended Practice 1173 entitled "*Pipeline Safety Management Systems."*
4. **NTSB Pipeline Accident Report - NTSB/PAR-19/02** - Adopted September 24, 2019. This is the NTSB's final report of investigation in the Merrimack Valley accident. It includes the probable cause of the accident and an additional recommendation regarding emergency response.
5. **NiSource Safety Culture Post-Assessment Report for Columbia Gas of Massachusetts** –November 18, 2019. This 12-page internal report was performed by a third-party and cited six "suggested areas for improvement".
6. **The "1st Dynamic Risk Report" –** On January 29, 2020, Dynamic Risk Assessment Systems, Inc. issued a 294-page report entitled "*Statewide Assessment of Gas Pipeline Safety: Commonwealth of Massachusetts."* The report was commissioned by the DPU and contained 37 recommendations to all gas companies and other related entities in Massachusetts.
7. **The "2nd Dynamic Risk Report" –** On June 22, 2020, Dynamic Risk Assessment Systems, Inc. issued a report entitled *"Independent Assessment of Columbia Gas of Massachusetts' Merrimack Valley Restoration Program."* The 149-page report was commissioned by the DPU and identifies opportunities for CMA and its successor to close gaps over time. Six recommendations to CMA were issued.
8. **The "Blacksmith Report" –** On June 29, 2020, The Blacksmith Group issued a report entitled *Northeast Gas Association (NGA) Pipeline Safety Management System Assessment.* This 36-page report was commissioned by NGA to perform a conformance analysis of the requirements of API Recommended Practice 1173 as compared to their existing practices.
9. **Joint Petition / Settlement Agreement** - On July 2, 2020, CMA/NiSource, Eversource Energy, and others executed a Settlement Agreement pertaining to the proposed sale of CMA by NiSource to Eversource. Appendix A provides a 13-page *"Comprehensive Safety Assessment and Implementation Plan"* that lists 32 "areas of focus" related to safety that Eversource must complete within the next 6 to 15 months depending on the complexity of the task.
10. **DPU Consent Order / Compliance Agreement (DPU 19-140)** – August 14, 2020. This agreement requires that CMA, by September 30, 2020, *"… provide documentation to the DPU to show it has complied with Items 1-8,"* the first five of which are the five NTSB recommendations. The agreement also stipulates other required tasks for CMA to complete under varying deadlines in return for resolving pending enforcement actions.

11. **CMA Response to DPU Letter INQ 84: Discovery of Inaccurate and Incomplete Regulator Station Drawings** -- September 18, 2020. This correspondence details the progress of CMA's efforts to identify, correct and resolve all regulator stations drawings in Massachusetts, and contains Root Cause Analysis report to explain why the drawings were found to be inaccurate.

3.2 Verification of CMA Work Activities and Projects.

As established in the Monitor's previous monthly report, all five NTSB recommendations are interrelated to some degree and share common processes. The Monitor team inventoried past and current CMA work activities relevant to the recommendations and selected suitable "Work Categories" to monitor and trace across the recommendation areas simultaneously. The diagram below provides an illustration of this methodology:



For this month's reporting period, the Monitor team reviewed hundreds of documents related to five recent projects that were all categorized as "Capital Work/Complex Projects" (depicted as the red box under the Work Category box in the graphic above). These five projects were in addition to the four projects and activities reported in the Monitor's August monthly report. The following is a summary listing of all nine projects and activities beginning with the most recently reviewed:

- **Oak Street Methuen Gas Main Replacement** *(Capital Project)*
- **Center Street Brockton Gas Main Replacement/Retirement** *(Capital Project)*
- **Reservoir Street Mansfield Growth Project** *(Capital Project)*
- **Hickory Street Springfield Public Improvement/Retirement** *(Capital Project)*
- **West Elm Street Bridge Relocation Brockton** *(Capital Project)*

Reported out last month:

- **Newbury Street Gas Main Replacement** *(Capital Project)*
- **Dig-In Incident: July 9, 2020 - Oak Street, Lawrence** *(Damage Prevention)*
- **Dig-In Incident: July 21, 2020 - Plymouth Ave, Marshfield** *(Damage Prevention)*
- **Marshfield Emergency Main Replacement -** Plymouth Ave.*(Capital Project)*

Specific observations from all of these projects are cited in Section 4.0 as support for the Monitor's assessment of CMA's compliance with each of the five NTSB recommendations.

Additionally, as discussed later in this report, the Monitor reviewed numerous activities in the other Work Categories of Maintenance and Compliance Programs, including service

abandonments, service retirements, valve inspections, leak repairs, and other activities. These items were documented on CMA's "COVID Catch Up" listing discussed later in this report.

3.3 Interviews Conducted

The Monitor continued to obtain specific information from the senior leadership and management of CMA and NiSource, as well as subordinate employees and the "rank and file" who are at the front lines of CMA's services. During this reporting period (September), the Monitor team completed 17 additional structured interviews[14] of individuals (and groups) as detailed below:

Persons from CMA
- CEO & President
- Chief Operating Officer *(4x)*
- Director, Safety, Compliance, Risk *(2x)*
- Manager, Lawrence Operations Center *(2x)*
- Leader, Field Operations, Lawrence
- 2 M&R Maintenance Mechanics, Lawrence
- Manager, Operations Compliance

Persons from NiSource
- Managers, Emergency Prepared. & Response (4 different people)
- VP Ops Integration & Emergency Management
- Asset Program Owner (DIMP)

Persons External to CMA/NiSource
- Director, DPU Pipeline Safety Division
- Deputy Director, DPU Pipeline Safety Division

Since the Monitor began its work in late April, a total of 76 interviews have been conducted with 47 people. A comprehensive listing of all individuals interviewed by the Monitor team to date is provided in Appendix F.

3.4 Site Visits Completed

Members of the Monitor team conducted three site visits during this reporting period to familiarize themselves with pertinent CMA operations. These visits are in addition to the 5 site visits that were reported in the Monitor's previous monthly report. A complete list of all site visits conducted by the Monitor team since the Monitor began its engagement can be found in Appendix F. A summary of the site visits conducted for this Monthly Report is presented below:

- *CMA Temporary Office in the Merrimack Valley.*
  Following the Merrimack Valley Accident, CMA established a temporary office in North Andover that is used for coordinating restoration-related work. The leased building contains offices, cubicles and conference rooms for up to 50 employees along with copying machines, company network access, supplies and other support equipment. The office was used by the managers and staff involved with investigation support, compliance items and legal issues related to the Merrimack Valley accident. The office is currently being decommissioned. Monitor Team members toured this facility and utilized it to conduct interviews and document production.

- *Lawrence Operations Center*
  On September 10, 2020 members of the Monitor team visited CMA's Lawrence Operations Center (see photo at right). They toured the facility, examined its supply of emergency equipment, spoke with several employees, and interviewed a manager and a supervisor in a newly renovated conference room that can be used as a command center.

[14] Because of the COVID-19 pandemic, most of the interviews took place via videoconference hosted by the Monitor. However, several individuals were interviewed during two site visits.

A small mobile trailer that can be used as a mini-command post during an incident was also examined at the Lawrence Operations Center, as well as a vehicle that had a Picaro leak detection system installed (see photos below).

- *Oak Street Station in Methuen*

The Monitor team members also toured a Point of Delivery Transmission/Regulator Station on Oak Street in Methuen. They viewed sensor lines at an above-grade regulator station and a "slam shut" device (see photos at left and below). They also spoke with Measurement and Regulation (M&R) technicians at length regarding the facility and also their recent experience with monitoring gas pressures during tie-in work.

Slam-shut Device

3.5 Planned Activities for October

Until the closing of the Sale of the CMA Assets is completed and the Court approves the Final Sale Certification, the Monitor will continue its work into October in accordance with its accepted semiannual Work Plan unless otherwise directed by the Court. The Monitor team is identifying additional CMA work projects to review, collecting details regarding the results from CMA and its contractors for the inaccurate regulator station drawings, and scheduling interviews with managers and staff from CMA (Brockton) and NiSource. Additionally, the Monitor plans to begin to address the Quality Assurance/Quality Control (QA/QC) processes at CMA.

The Monitor also plans to conduct a site visit at CMA's Brockton Operations Center, and is scheduling interviews with individuals who hold the following positions at CMA and NiSource:

- Sr. VP of Utility Technical Services (NiSource)
- Brockton Operations Center Manager (CMA)
- Work Coordinators/Inspectors (CMA)
- CMA Contractor Employees

Assuming that the acquisition of CMA or the CMA Assets by another company does not occur in October, the Monitor's next Monthly Report is scheduled for submittal to the Committee on Friday, October 30, 2020.

4.0 Assessment of CMA's Compliance with the NTSB Recommendations

4.1 Background

Two months after the Merrimack Valley accident, the NTSB issued four Safety Recommendations to NiSource that were classified as "urgent" via NTSB Report Number PSR-18-02, *Natural Gas Distribution System Project Development and Review*, dated November 14, 2018 (see Appendix B). A fifth recommendation addressing Emergency Response Planning and was issued about one year later when the NTSB published its final report of the Merrimack Valley accident on September 24, 2019.[15] As stated previously, the Monitor notes that the NTSB issued its recommendations to NiSource; however, the Court, through the Plea Agreement, tasked the Monitor to focus on CMA's compliance with the NTSB recommendations.

All four of the "urgent" recommendations have since been classified as "closed" by the NTSB. Repeated requests to the NTSB by the Monitor to discuss their views regarding this action were refused. However, a comprehensive review of all available correspondence and information obtained from interviews with NiSource and CMA employees revealed that the NTSB decisions to close the recommendations were based on the following:

- Letters received from NiSource
- CMA Gas Standard GS 1680.010 - *"Tie-Ins and Tapping Pressurized Pipelines";* 04/19/2019
- CMA Gas Standard GS 2810.050 – "*Stakeholder Reviews of Design Capital Projects";* 7/1/2019
- A report by TRC entitled "*Report on Compliance with NTSB Recommendation Item #2 Material Verification Records,"* dated April 7, 2019
- Presentations by NiSource officials during meetings held at NTSB headquarters in December 2018 and April 2019.

The NTSB did not conduct any audits or site visits to observe NiSource/CMA work processes nor did it request or examine any additional documentation that would be generated in accordance with the requirements of GS 1680.010 or GS 2810.050. Additionally, no CMA officials participated in the discussions with NTSB regarding the closing of these recommendations.

All five recommendations are presented in full below, followed by a summary of the Monitor team's observations, assessments and findings:

4.2 Recommendation P-18-006: *Constructability Reviews / PE Stamp*

> Revise the engineering plan and constructability review process across all of your subsidiaries to ensure that all applicable departments review construction documents for accuracy, completeness, and correctness, and that the documents or plans be sealed by a professional engineer prior to commencing work.

In its final report on the Merrimack Valley accident, the NTSB stated that *"The development and implementation of GS 2810.050, including the requirement that construction documents and plans be sealed by a P.E., satisfies Safety Recommendation P-18-6 …"*

The Monitor's review of the requested work activity documents from CMA for the five capital projects cited in Section 3.5 above indicates that CMA's controls appear to be complaint with

[15] NTSB Pipeline Accident Report NTSB/PAR-19/02, *"Overpressurization of Natural Gas Distribution System, Explosions, and Fires in Merrimack Valley, Massachusetts, September 13, 2018."* Adopted September 24, 2019. https://www.ntsb.gov/investigations/AccidentReports/Reports/PAR1902.pdf

NTSB recommendation P-18-06. The Monitor notes that a major driver of that compliance is CMA's adherence to GS 1680.010 and its associated activity checklists. Since its tasking began, the Monitor has now completed a review of 7 capital projects (including the five cited above) and notes that each design was reviewed and approved by a licensed PE.

All of the PE reviews of CMA projects that the Monitor team has reviewed to date have been performed by contracted PEs employed by TRC Companies, Inc., a third-party natural gas engineering contractor. According to NiSource representatives, the PE's are requested on a regular basis by NiSource's design engineers, standards engineers, engineering management and construction staff to render both general and project specific recommendations on the conformance of NiSource standards to the current regulatory requirements.[16] The Monitor notes that contracted PE work can be just as effective as in-house PE reviews and believes that a more critical factor is the level of experience of the PE specifically in gas operations.

The time limitation of the short tenure of the Monitor, coupled with restrictions associated with COVID-19, did not afford the opportunity to conduct field visits to witness the actual progress of the job construction of the seven capital projects. As such, reviews were performed remotely by examining design work packages, planned construction activities, and associated completion activities as dictated by the progress of the job.

The Monitor notes that all of these activities are documented on many checklists. Checklists of work activities (i.e., pre, during and post construction) make up a significant portion of CMA's efforts to comply with the intent of NTSB Recommendation P-18-06 (as well as P-18-09 discussed later in Section 4.4). In some instances, work packages that were examined by the Monitor were in excess of a hundred pages. CMA has performed well in this area based on the documentation review. However, the Monitor cautions that the sheer volume of these checklists could prompt undisciplined, inexperienced, and/or inadequately trained personnel to take on a "check the box" mentality. Awareness of this potential vulnerability by CMA and any purchaser of CMA or the CMA Assets is essential to ensure the safe operation of the gas system.

Finding no 1: CMA appears to have substantively implemented the practice of ensuring that engineering plans, constructability documents and drawings are accurate and complete by having a PE review and sign them, per NTSB recommendation P-18-006.

4.3 Recommendation P-18-007: *Documentation is Traceable, Reliable and Complete*

Review and ensure that all records and documentation of your natural gas systems are traceable, reliable, and complete.

Despite stipulating that *all* records and documentation should be determined to be traceable, reliable and complete, NiSource interpreted the intent of this recommendation to apply only to its low pressure regulator stations, and specifically to the sensor lines associated with these facilities. In his May 10, 2019 letter to NTSB Chairman Robert Sumwalt, NiSource CEO Joe Hamrock claimed that NiSource *"has completed locating, marking, and mapping control (regulator-sensing) lines at all 2,072 low-pressure regulator runs across its seven state system,"*

[16] According to NiSource, TRC PEs maintain access to the most current NiSource standards through an online portal to its corporate database. When performing a project specific endorsement, the PEs rely on their general knowledge of all NiSource standards during design development and review, and they also consult individual standards on a case-by-case basis to ensure an individual project conforms to the standards and the standards are current with regulatory requirements.

including the 121 low pressure stations at CMA. This work was accomplished by CMA/NiSource Measurement and Regulation (M&R) technicians in about four weeks in late 2018.

The May 10 letter also stated that NiSource contracted with TRC Solutions "*to verify the assets required to safely operate its low-pressure gas systems and ensure these assets are clearly indicated on relevant maps and records.*" The Monitor was subsequently advised by a CMA executive that the TRC review did not constitute a validation of the work that NiSource/CMA technicians had performed. In its April 7, 2019 report TRC made the following statement within "Section 2.2 Schematic Review":

> *"TRC performed a cursory review of the 2072 schematics and found they were all similar in style and format. They were all drawn in CAD and converted to Adobe pdf format and fit on 8.5" x 11" paper when printed. Each sensing line has dimensions for each turn in the sensing line from the regulator to the downstream tie-in point. All equipment uses the proper symbol designation. The sensing line has a different line style than the piping, and a legend shows the color and line for each of the line's pressure designation. The date of the drawing and the physical address of the location are also included in the title block.*
>
> *The schematics detail the presence of critical facilities responsible for pressure control on the low pressure systems and are captured within the* GIS.[17] *These schematics have detailed the major equipment within each station and the accompanying material information is stored in WMS*[18] *which provides records that are traceable, reliable, and complete for the low pressure regulator stations."*

NiSource provided a presentation to NTSB of its work to address this recommendation, including the TRC report, in a meeting on April 18, 2019. Interviews conducted by the Monitor with individuals who had been involved in these discussions with the NTSB expressed surprise that NTSB had not conducted any site visits or requested any other documentation (such as actual isometric drawings of regulator stations) to verify NiSource's resolution of this recommendation. In a July 22, 2019 letter from NTSB Chairman Robert Sumwalt to Mr. Hamrock, the NTSB declared that Recommendation P-18-7 was *"Closed – Acceptable Action"*.

About one year later, on June 26, 2020, the Monitor was notified by CMA of the discovery of inaccurate, unsigned and undated drawings of regulator stations within CMA that had been discovered by a contractor. The Monitor was concerned with this finding since it related directly to the regulator sensing lines addressed by the NTSB recommendation. The Monitor immediately requested records and documents associated with the matter and issued an "Alert Report" (see Attachment E) on June 29, 2020 to the Committee as discussed in the Monitor's July report.

CMA advised the DPU on June 29, 2020 that it had initiated a project to resolve inaccurate and incomplete regulator station drawings and determine the root cause of these errors. The Monitor has now received CMA's September 22, 2020 report on this project as well as a report by *Campos EPC* dated September 17, 2020 validating the correction of discovered errors and deficiencies in the isometric drawings of both Low Pressure and Non-Low Pressure Regulator stations at CMA. The Monitor has also received a 5-page Root Cause Analysis (RCA) Report of the original isometric drawing deficiencies prepared by *ThinkReliability*, a Texas-based engineering consulting firm.

[17] Geographic Information System implemented in ESRI's ArcFM tool.
[18] Mainframe work management system written in the 1990s.

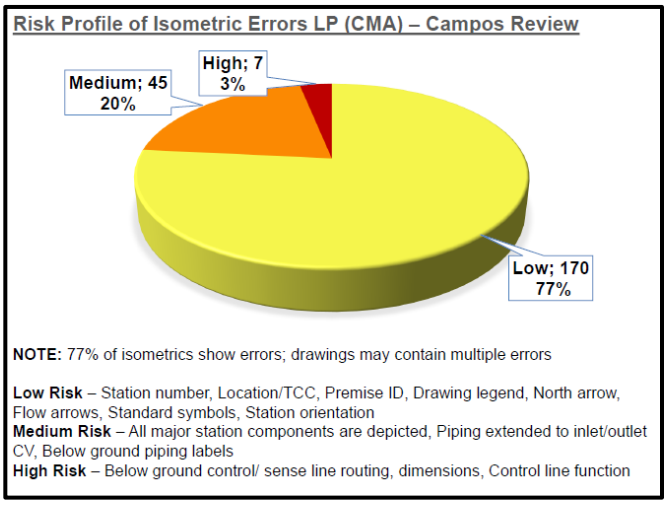
The validation project involved four phases, all of which have been recently completed:

- *Phase A* - Off-site engineering review of all records associated with both Low Pressure (121) and Non-Low Pressure (101) regulator stations performed by CMA field engineers;
- *Phase B* - On-site review of each Low Pressure and Non-Low Pressure regulator station by CMA M&R technicians who submitted necessary revisions to drawings;
- *Phase C* - Updating or correcting isometric drawings by CMA Field Engineers and on-site delivery and validation by CMA M&R technicians to each of the Low Pressure and Non-Low Pressure regulator stations.
- *Phase D* - site visits by *Campos EPC*, accompanied by CMA Field Engineers, to each of the Low Pressure stations to review the revised isometric drawings using a Station Isometric Drawing Review Checklist.

Subsequent to each of the 121 site visits conducted in Phase D, *Campos EPC* transmitted the checklists along with redline drawings identifying any errors. *Campos EPC* then reviewed the revised drawings and, once approved, notified CMA Field Engineering that the drawing was ready for printing and delivery to the station. This same multi-step procedure was used for 39 of the Non-Low Pressure stations; however, the remaining 62 Non-Low Pressure stations were completed with a somewhat more streamlined process that involved a single phase process of site visits performed by a team consisting of CMA Field Engineers, a CMA M&R technician and a *Campos* EPC engineer.

Results of the Phase A engineering review of the 121 low pressure stations and 101 non-low pressure stations identified errors in **100%** of the isometric drawings.[19] For the low pressure stations, 482 (23%) of these errors were categorized as High Risk involving the sensor control lines (below ground sense line routing, dimensions and control line function). These High Risk errors were found at 119 of the 121 stations. Of the remaining errors 625 (30%) were Medium Risk and 1002 (47%) were Low Risk. For the 101 non-LP stations there were 147 (23%) High Risk, 110 (17%) Medium Risk and 379 (60%) Low Risk errors.

The Phase D review by Campos EPC for the 121 Low-Pressure stations revealed 7 (3%) High Risk, 45 (20%) Medium Risk and 170 (77%) Low Risk errors remaining after the Phase A-C work had been accomplished (see graphic at right). The Monitor has been advised that all of the errors identified by *Campos EPC* have now been eliminated.



In addition to the four phase project described above to identify and correct the isometric drawing errors CMA commissioned *ThinkReliability* to conduct a root cause analysis (RCA) to assess the reasons for the failure of the work performed by NiSource/CMA subsequent to the Merrimack Valley accident to identify and correct isometric drawings of the low pressure regulator stations. *ThinkReliability*'s conclusion was:

[19] In his May 10, 2019 letter to NTSB Chairman Robert Sumwalt, NiSource CEO Joe Hamrock claimed that NiSource *"has completed locating, marking, and mapping control (regulator-sensing) lines at all 2,072 low-pressure regulator runs across its seven state system,"* including the 121 low pressure stations at CMA.

> *"The urgency of action to update the LP isometrics did not allow sufficient time to develop the necessary documents to ensure proper controls and expectations were defined and communicated prior to starting work. The initial and ongoing project planning for updating isometric drawings may not have had enough detailed guidance to ensure drawings were updating completely and correctly. The internal resources used to conduct redlines on the isometric drawings likely did not have adequate experience and training. Additionally, the QA/QC process was either not in place or insufficient to identify deficiencies."*

The recently completed validation project addresses the mapping and documentation failures that contributed to the 2018 Merrimack Valley overpressure accident in a far more robust and comprehensive way than the NiSource/TRC activity that was used by the NTSB in support of closing Recommendation P-18-07 as Acceptable Action in July of 2019. On the basis of the CMA, *Campos EPC* and *ThinkReliability* reports, it appears that documentation associated with low pressure regulator stations and their sensing lines is now *traceable, reliable and complete*.

Recognizing that NiSource and NTSB settled upon a much narrower scope than that "*all records and documentation of your natural gas systems are traceable, reliable, and complete*", the Monitor is concerned about the discovery of inaccurate records from recent work activities recently undertaken by CMA. As referenced in its previous monthly report, the Monitor noted that some records exhibited evidence of a number of deficiencies that appear to be related to inadequate documentation in areas *other than* those of the low pressure regulator stations.

For example, the Monitor team noted examples of unmapped and unmarked gas service stubs as well as inaccurate or missing Service Line Records (SLR) resulting in mismarked gas assets that were then subsequently damaged during first, second- and third-party excavations. Specific examples cited in its July report include:

- *Dig-In Incident: July 9, 2020 - Oak Street, Lawrence* - A CMA contractor struck and damaged an unmarked/unmapped 1.25-in. gas service stub that was 13 feet away from the 3-inch gas main. No service line record (SLR) was found for this location. The records indicate that the technician did not have enough cellular signal to view the SLR. Additionally, SLR information is not yet uniformly part of the CMA Geographic Information System (GIS), and, as such, locates need to access multiple systems to obtain the information they need.[20]
- *Dig-In Incident: July 21, 2020 - Plymouth Ave, Marshfield* -- During an emergency telecommunications pole replacement, the telecommunications company struck a gas main which was mismarked by 30 inches. As a result of the incident, the Operator Qualification (OQ) of the Locate and Mark technician was removed and the individual was retrained. While the expedited OQ removal was prudent, this event indicates a potential lack of competency and training.

The Monitor also noted information from its interviews that indicates occurrences of inaccessibility to service line records, lost/missing records, and the lack of a fully integrated electronic GIS and SLR system. These factors can cause inaccuracy of Locate and Mark activities which can lead to potentially serious dig-in events.

[20] The Monitor notes that NiSource is working to develop a capability in GIS where unmarked service lines may be identified in cases where outdoor meters exist in order to assist employees with the identification of service lines prior to excavation.

Finding no. 2: CMA's implementation of recommendation P-18-007 has been accomplished, but only recently and only if compliance is determined against records and documentation applicable to low pressure regulator station sensing lines which is a narrower scope than the exact language of the recommendation (i.e. "*all* records …) that was set by NiSource and accepted by the NTSB. The Monitor noted many discrepancies related to the accuracy of documentation for lines *other than* regulator station sensing lines as well as inaccessibility to service line records (SLR), lost/missing records, and the lack of a fully integrated electronic Geographic Information System (GIS) and SLR system.

4.4 Recommendation P-18-008: *Management of Change (MOC) Process*

Apply management of change process to all changes to adequately identify system threats that could result in a common mode failure.

The NTSB closed this recommendation as "Acceptable Action" in its October 14, 2019 final report on the Merrimack Valley accident. In the report, the NTSB concluded that:

> *NiSource improved its MOC process by developing and using Gas Standard 1680.010, 'Tie-Ins and Tapping Pressurized Pipelines,' and NiSource now requires the use of a written tie-in plan template.… NiSource also developed and implemented an MOC procedure for its construction employees and contractors that details the steps needed to ensure safety on a project during change in personnel."* [21]

Section 9.3 of the NiSource SMS Standard states that *"The MOC process is utilized when technology, equipment, procedural or organizational changes are being considered."* The section further states: *"The SMS Process – Management of Change outlines a process for identifying the potential risks associated with the change and any required approvals prior to the implementation of such changes."* The statements in the SMS Standard appear substantially compliant with API Recommended Practice1173 addressing Pipeline Safety Management Systems although they do not establish a formal MOC procedure.

The Monitor believes that the formal MOC process – as stipulated by API Recommended Practice 1173 -- had not been accomplished by NiSource at the time the NTSB closed this recommendation on September 24, 2019, nor has it been fully implemented at CMA as of the date of this report.

The Monitor received a draft NiSource document titled *SMS Process - Management of Change (MoC),* dated August 27, 2020. The Monitor was also provided a timeline provided by NiSource that indicated a formal MOC process was to be rolled out to its entire organization in September 2020 along with the creation of a Central MOC Committee and plans for initial training. The draft MOC process establishes a NiSource MOC Review Committee and identifies roles of MOC Initiators depending on whether the change involves Organizational, Physical, Procedural or Technological changes. The MOC process also includes a 3-page Management of Change Review Request. NiSource indicated that it expects to begin processing entries to the MOC system via these paper forms on October 1, 2020. A digital version of the procedure, to be incorporated into the NiSource Corrective Action Program (CAP), is expected to be completed by the end of the 2020.

[21] The Monitor also noted that the only reference to "management of change operations" in GS 1680.010 is this statement on page 1: *"The phrase 'management of change operations' has been introduced as a way to explain tapping and tie-in operations."* The Monitor also noted that this phrase does not appear in the "Tie-in Plan Template."

The Monitor notes that this MOC procedure has not yet been implemented at CMA because NiSource has yet to finalize and roll out this policy. At this late date, and given the imminent sale of the CMA Assets to Eversource, the CMA COO advised the Monitor that it did not intend to implement the NiSource MOC policy, but instead plans to incorporate the existing Eversource MOC policy although CMA officials are not yet familiar with the Eversource's MOC process, nor is the Monitor.

The Monitor notes that it is instructive that the *ThinkReliability* root cause analysis report cited in relation to NTSB Recommendation P-18-07 above contended *"that the root cause for the incorrect isometric drawings was due to a lack of management of change (MOC) process."* While the Monitor recognizes that the effective development and implementation of MOC takes time and is a challenge to the entire industry, the Monitor believes that CMA/NiSource's efforts with MOC are overdue and the delay is indicative of a company that was once overly distracted by crisis. To its credit, CMA's decision to delay implementation of a MOC policy until the closing of the sale of the CMA Assets to Eversource reflects the kind of organizational change contemplated by the MOC guidance of API Recommended Practice 1173.

The Monitor notes that NiSource/CMA incorporated language and guidance in late 2019 into several existing processes involving the management of document changes across its various asset classes and records. According to NiSource executive leadership, the *Distribution Integrity Management Program (DIMP)* [22] and the *Transmission Integrity Management Program (TIMP)* contain MOC procedures. However, he indicated that the existing "MOC" language in these programs relates to document management and retention rather than the description and intent of MOC described in API Recommended Practice 1173.[23]

NiSource has advised the Monitor that both the *Map Revision Procedure* and the *Standards Update Process* are being implemented within their Corrective Action Program (CAP) tool. Inputs from CAP, including NiSource's new MOC procedure, will be used to assess and evaluate risk and are formally reviewed by the Gas Segment Risk Table (NiSource) and State Risk Table (CMA) to update the Risk Register.

The Monitor's review of documents from the selected CMA projects exhibits evidence that changes and revisions are being addressed to some degree; however, the existence of a robust and mature MOC process is not evident. This is also consistent with NiSource's own self-assessment of the maturity of its MOC as an element of SMS.

Finding 3: A robust, mature and integrated MOC has not yet been fully implemented at CMA. The company still does not have a formalized MOC procedure as described in its SMS policy document and/or API Recommended Practice 1173 for SMS. NiSource has only recently produced a final draft MOC procedure as described in its SMS standard, and declared its intent to roll out the procedure in September. The Monitor's current understanding is that NiSource will begin its rollout of MOC in October, and that as a result, CMA has centered its efforts on compliance with the MOC policy of Eversource since CMA's transfer to Eversource is imminent.

[22] Section 12.0 Management of Change is clearly intended to keep the DIMP document up to date and to record changes that are made to it, and this is the responsibility of the Integrity Engineer. The last changes were made to the document on 11/16/2019 and these included a new section mentioning the NTSB recommendations (8.2.8.9), the slam-shut devices (8.2.8.8) and expansion of SMS verbiage (8.2.9).

[23] Section 8.3 in API Recommended Practice 1173, entitled "Management of Change," states the following: "The pipeline operator shall maintain a procedure for management of change (MOC). For each MOC, the pipeline operator shall identify the potential risks associated with the change and any required approvals prior to the introduction of such changes…. The types of changes that a MOC procedure addresses shall include:1) technology,2) equipment,3) procedural, and 4) organizational.

4.5 Recommendation P-18-009: *Control Procedures & Gas Pressure Monitoring*
Develop and implement control procedures during modifications to gas mains to mitigate the risks identified during management of change operations. Gas main pressures should be continually monitored during these modifications and assets should be placed at critical locations to immediately shut down the system if abnormal operations are detected.

A summary of NTSB's response to NiSource's May 2019 letter to NTSB indicates that NiSource asserted it had made "significant" enhancements to its tie-in and tapping procedures, including risk assessments, thorough checklists, and the development of contingency plans. NiSource also stated that it was installing automatic pressure-control equipment and remote monitoring devices on every low-pressure natural gas distribution system across its operating area.

Senior executives at CMA and NiSource have reported to the Monitor that the company has completed the installation of automatic pressure-control equipment devices in all of its low pressure regulator stations. Additionally, the Monitor's review of the requested work activity documents from CMA for the five capital projects cited in Section 3.5 above indicates that CMA's controls are complaint with NTSB recommendation P-18-08. A major driver of that compliance is CMA's adherence to GS 1680.010 and its associated activity checklists. As stated previously, checklists make up a significant portion of CMA's efforts to comply with the intent of this recommendation as well as recommendation P-18-06.[24]

This view is consistent with the Monitor's review of capital projects as reported out in its last monthly report. Evidence that supports CMA's implementation of gas pressure monitoring during its work as per GS 1680.010 include this specific example cited in the Monitor's August report:

- *Newbury Street Gas Main Replacement* - All records, including pre- and post- engineering and construction plans, were compared to CMA standards and applicable rules and regulations for verification. The records indicate that the project as designed incorporates measures for identifying tie-in procedures, monitoring gas main pressures, determining regulator stations that may be impacted, considering gas main valves that may be operated in the event of an AOC, etc. The Monitor's review of the completed checklist documents for three tie-ins associated with this project revealed that all appropriate checklists calling for main tie-ins, monitoring pressures, purging, etc., were followed. Pursuant to GS 1680.010, all steps were stamped by a PE and documented by the CMA personnel performing the gas main installation and associated tie-ins of new gas main.[25]

The Measurement and Regulation Department (M&R) department at CMA is responsible for maintaining the regulator stations in the CMA natural gas distribution system. At the time of the Merrimack Valley accident, the M&R department consisted of 11 full-time technicians across Massachusetts, with two technicians in the Lawrence area who had more than 45 years of experience between them. In recent discussions with the Monitor, M&R technicians and their supervisors indicated that several more M&R personnel have been added at CMA, but that the experience level in the M&R area has decreased. One technician estimated that the average experience level of an M&R technician was two years. Several technicians indicated that they very much appreciated recurrent training.

[24] The time limitation of the short tenue of the Monitor, coupled with restrictions associated with COVID-19, did not afford any field visits to witness the actual progress of the job construction of the seven Capital projects. As such, reviews were performed remotely by examining design work packages, planned construction activities, and associated completion activities as dictated by the progress of the job.

[25] Work is still on-going for this project and the Monitor has requested to remain apprised of work status.

Finally, the Monitor noted that all of the M&R technicians and their supervisors spoke with good familiarity and confidence in "monitoring pressures" when work is being performed. They discussed how they utilize a texting system to communicate with each other during work in which technicians are physically present at the work site.

Finding 4: CMA has substantively implemented procedures to identify risks and continually monitor gas main pressures during tie-in and tapping which appear to be consistent with the intent of NTSB recommendation P-18-009.

4.6 Recommendation No. P-19-018

Review your protocols and training for responding to large-scale emergency events, including providing timely information to emergency responders, appropriately assigning NiSource emergency response duties, performing multi-jurisdictional training exercises, and participating cooperatively with municipal emergency management agencies.

This recommendation was issued in the NTSB final report on the Merrimack Valley accident adopted on October 24, 2019. Correspondence dated December 23, 2019, from NiSource to NTSB regarding this recommendation was reviewed by the Monitor. The NTSB responded in a letter dated May 10, 2020 stating that this recommendation remained classified as "Open – Acceptable Response." On September 22, 2020, NiSource sent an updated letter to the NTSB regarding their recent efforts to implement this recommendation.[26]

The Monitor recognizes that pipeline companies are responsible for ensuring the safety of those living and working in close proximity to pipelines and related facilities. As part of this responsibility, pipeline operators must have detailed Emergency Response Plans in place that provide the direction, protocols and tools necessary to effectively respond in the event of a pipeline emergency.

In its final report of the Merrimack Valley accident, the NTSB cited the following three findings related to emergency response:

- The communications issues during the September 13 overpressurization illustrate the need for emergency planning for a multi-jurisdictional response.
- The Columbia Gas of Massachusetts incident commander faced multiple competing priorities, such as communicating with affected municipalities, updating the emergency responders, and shutting down the natural gas distribution system, which adversely affected his ability to complete his tasks in a timely manner.
- Columbia Gas of Massachusetts was not adequately prepared with the resources necessary to assist emergency management services with the response to the overpressurization.

At the time of the accident, CMA's emergency response policy was not based on the Incident Command System (ICS), an internationally recognized model used by most first responders for emergency response. The ICS model provides a framework through which a pipeline operator and appropriate emergency responders can work together to effectively manage an emergency and deploy response resources. It also allows for member companies to share resources during incidents that require a large-scale response. ERPs are enacted in the event of an incident and are designed to ensure public safety by providing clear safety and stabilization direction for employees, first responders and others involved in responding to an emergency situation.

[26] The NTSB has not yet responded to NiSource as of the date of this report.

As part of an annual requirement with the DPU, NiSource – on behalf of CMA -- submitted a 125-page updated document to the DPU on May 15, 2020 entitled: *Columbia Gas of Massachusetts Emergency Preparedness and Response Plan (EPRP) 2020.* The Monitor has evaluated and compared this plan with CMA's 206-page *Emergency Manual Guidelines for Emergency Response at Columbia Gas* (EM). Both plans exist simultaneously within CMA. The EM exists for all states; however, the EM for CMA also includes an additional section that is specific to CMA's response plan dealing with tactical and operational requirements through specific CMA Gas Standards. The Monitor notes that the redundancy of these two documents may be confusing and therefore may negatively affect emergency response. Consideration should be given to consolidating the essential EM requirements into the EPRP thereby providing a single source document for Emergency Response and Preparedness.

In response to the Merrimack Valley accident, NiSource created and staffed a new Emergency Response and Preparedness Team. The Team owns the NiSource's EPRP which does not address operational issues but rather focuses on planning, training, response organizational structure and response scalability. NiSource has also developed a "Go Team" composed of 20 employees, systemwide who possess specific expertise and are trained and certified to assume IC Command/General Staff positions in support of an incident response as required by the operating companies during an incident. The Monitor notes that there are no CMA employees serving on the NiSource Go Team.

As previously reported in its August monthly report, two Monitor team members conducted a tour of CMA's newly procured Mobile Command Center (see photo at right). This vehicle will be a valuable asset for any future large-scale emergency event and also for weather-related emergencies.

CMA's revised EPRP addresses the need to conduct exercises. It states:

> *"Exercises are conducted annually based on a schedule that is developed and approved by the Gas Segment Emergency Preparedness and Response Team. Large scale/Regional Exercises are conducted periodically to test the highest potential incident level as outlined within the EPRP. NiSource conducts an After Action Review of each exercise and makes any necessary adjustments to the EPRP based on lessons learned. Major revisions to the EPRP will be memorialized in Section 10."*

Additionally, one monitor team member observed NiSource's Third Quarter Emergency Preparedness and Response *Functional Exercise* held on August 25, 2020. Due to the COVID-19 pandemic, the exercise was mainly a virtual event[27] that simulated large-scale multi-jurisdictional emergencies in the state of Indiana. The Monitor notes that although several CMA managers observed this exercise, none were active participants.

The Monitor notes that NTSB recommendation P-19-018 includes the phrase *"performing multi-jurisdictional training exercises"* in the context of revising its protocols and training. The Monitor found no evidence to indicate that CMA has held any *exercises* of a *multi-jurisdictional* nature since the Merrimack Incident in 2018.

[27] The only teams on site in Indiana were representatives from the NIPSCO Gas Incident Management Team, Carroll County Public Safety and White County Public Safety. NiSource established WebEx meetings for each of these participating groups. As an observer, the Monitor member watched as these groups responded to an increasingly complex incident scenario. The exercise required the use of a website called Simulation Deck (SimDeck) as well as WebEx for exercise play. SimDeck allowed the team member to view the exercise scenario information (injects, social media posts, etc.).

Another Monitor team member observed a *tabletop* exercise conducted by CMA on September 24, 2020. The drill was a non-complex, non-multi-jurisdictional event that was rated as a Level 4 emergency.[28] The scenario involved a small evacuation and no explosion after a contractor ruptured a steel gas main in a semirural neighborhood in Northampton, Massachusetts. The exercise was led by a CMA employee in its Compliance division and was almost exclusively a CMA/NiSource activity with two observers from Eversource. Participants included a local fire chief and police captain as first responders along with CMA staff in typical ICS positions such as communications, field personnel, engineering and gas control. The drill exposed challenges with identifying local isolation valves to shut off the gas as well as a lack of ICS experience.

During its review of Emergency Response and Preparedness at CMA, the Monitor team identified a gap related to the level of actual experience associated with managing complex multi-jurisdictional Level 1 and 2 incidents in the IC command position. The Monitor team began preparing an Alert Report to the Committee identifying the gap; however, action was taken by CMA's Chief Operating Officer (COO) who concurred that a gap existed. His action involved seeking the assistance and a commitment from Eversource to provide a trained and very experienced incident commander to head any CMA response requiring that level of skill for any Level 1 or 2 event that may occur prior to the sale and during the period of transition of assets and people from CMA to Eversource. The Monitor noted that this action was sufficient to address the gap for this interim period. To this point, the Monitor believes that experience, not just training, is essential to the management of a large scale event -- especially in the early stages when the crisis is unfolding and communication, coordination and resource allocation is critical to mitigate property damage and risk to human lives.

To its credit, and as cited in its most recent letter to the NTSB dated September 22, 2020, NiSource asserted that it had obtained significant IC experience recently as a result of the COVID-19 pandemic. The company stated that it engaged in a *"comprehensive, extended, multi-company utilization of both the ICS and the Area Command System across its seven-state footprint,"* and that this *"provided the first opportunity to implement a comprehensive, NiSource-wide response that incorporated lessons learned following the 2018 Merrimack Valley incident."* The Monitor recognizes the initiative and effectiveness of establishing an ICS command structure to address the pandemic, but notes that a corporate response to a pandemic differs from a Level 1 or 2 gas pipeline accident. Additionally, in discussions with CMA personnel regarding IC experience for Level 1 and 2 multi-jurisdictional incidents, the Monitor learned that several CMA employees felt that the 2nd gas release incident that occurred in Lawrence about one year following the Merrimack Valley accident provided that experience. However, the Monitor notes that, while that incident garnered significant attention, it was classified as a Level 3 event and did not substantively involve multiple jurisdictions.

The Monitor notes that Emergency *Planning* -- a critical component for training and preparation for a large-scale event -- resides within NiSource rather than its operating companies. The Monitor notes that this will require scrutiny and attention due to the uncertainty of emergency planning capability following the transition of CMA assets to Eversource.[29]

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[28] The following criteria are established as a guide in determining the level of an incident: Level 1- Catastrophic Incident lasting more than 72 hours and affecting over 1,000 customers; Level 2 – Severe Incident lasting less than 72 hours and affective between 500 and 999 customers; Level 3 – Serious Incident lasting less than 48 hours and affecting between 50 and 499 customers; Level 4 – Elevated Incident lasting less than 24 hours and affecting between 10 and 49 customers. Level 5 – Routine Incident lasting less than 8 hours and affecting less than 10 customers.

[29] The Monitor also notes that NiSource has not yet leveraged its obvious synergies between its electrical power and natural gas operations to benefit planning and emergency response capabilities.

Finally, the Monitor notes that work to complete mapping of CMA's assets into GIS is a project likely to extend for completion far into the future. This is a critical element for any utility with respect to potential emergencies -- to know where your assets are and how to locate them quickly, and an expedited resolution of this element is prudent.

Finding no. 5: CMA's revisions to its Emergency Preparedness and Response Plan, its implementation of the Incident Command (IC) model, and its heightened awareness for the importance of training and experience is consistent with the intent of recommendation P-19-018. However, CMA can improve its in-house IC experience and multi-jurisdictional exercise regimen for Level 1 or 2 emergencies.

4.7 Compliance with Applicable Laws and Regulations

The Monitor team's review of the requested documents from selected CMA activities cited in Section 3.2, and its review of other documents, have not revealed evidence of any non-compliance with applicable Federal and state laws or rules. Additionally, the work reviewed by the Monitor appears to align with NiSource/CMA standards as described in GS 1680.010 and GS 2810.050 cited above. However, given the limitations of time, resources, and travel, the Monitor cannot affirm that there are no potential violations of rules or laws in all areas at CMA.

Additionally, the Monitor recognizes that the COVID-19 pandemic necessitated the deferral of a substantial amount of mandated work since March 2020. The Monitor has been closely monitoring CMA's "COVID Catch-up Plan" as the company attempts to meet the DPU mandated compliance work by the end of the year. CMA has been attempting to meet aggressive monthly targets with some challenges. It closely tracks a "Monthly Compliance Scorecard" along with the Catch-up Plan. According the CMA Chief Operating Officer (COO), a weekly "Operations Call" is convened every Wednesday to review progress and discuss status. Additionally, another weekly call takes place with the CEO to review and discuss the consent order and compliance items. Frequent calls with the manager of the DPU's Pipeline Safety Division are also conducted. The COO expressed confidence that CMA will meet its year-end requirements.

Finding no. 6: The Monitor has not identified evidence of any specific non-compliance with laws and regulations applicable to the NTSB recommendations as identified in the Work Plan. However, due to the limitations of the Monitor's oversight, the Monitor cannot affirm that all aspects of CMA's operations are compliant with all such laws and regulations.

5.0 Safety Culture and Safety Management Systems.

5.1 Background.

As previously reported by the Monitor, Safety Culture is the embodiment of an organization's values, beliefs, attitudes, norms and practices as it relates to safety and risk. The expectations that lead to a positive safety culture are created at the top of the organization. Leadership enables success by their constancy of purpose, selfless and continuous adherence to what they profess, the allocation of resources, the alignment of goals within the organization, and by a strident unwillingness to compromise. A strong safety culture is the "glue that binds" people together toward a goal that is larger than themselves.

The NTSB's final report of the Merrimack Valley accident addressed the importance of safety culture in pipeline operations. This sentiment was supported and reiterated by all parties involved in the Plea Agreement. Additionally, the Monitor recognizes the impact of safety culture

on the prevention of accidents and incidents in all operational modes. The Monitor also recognizes that safety culture is an aspect that is interwoven into the issues addressed in all five of the NTSB's recommendations.

The Monitor referenced the American Petroleum Institute (API) Recommended Practice No. 1173 entitled *"Pipeline Safety Management Systems"* during its work. This recommended practice was developed by pipeline operators in 2015 specifically for pipeline operators. NiSource's SMS Standards document was also utilized.

5.2 Assessment of Selected SMS Elements that Support Safety Culture

The success of the SMS is directly related to the support of a safety culture. CMA/NiSource is progressing to develop its SMS capabilities across the range of the ten elements cited in API Recommended Practice1173, and CMA has been a beneficiary of that progress. This progress, however, is uneven over the range of the elements. During this reporting period, the Monitor team focused on selected elements of SMS which lend themselves to being reviewed in the context of the activities and processes of interest to the Monitor's Court-ordered tasking. The following is a summary of the Monitor's assessment of selected SMS elements:

- Safety Culture. The Safety Culture definition for CMA, as created by the NiSource SMS Standard, suggests that a Safety Culture *"is supported by the organization's leaders".* The Monitor believes that a Safety Culture is created by the organization's leadership at the highest level. Much like its business model, Safety Culture is the embodiment of an organization's values, beliefs, attitudes and norms. The premise for safety and the form it takes is created at the top of the organization and institutionalized throughout the organization with the support of leadership. The constancy of the message from Leadership is essential, not optional.

- Executive Leadership and Management Commitment. Individual performance goals have been set at CMA Leadership levels and then simply cascaded down through organizational layers, thus cementing a lack of employee ownership and alignment for performance goals that are inherited, that the employee did not build and which the employee can only partially impact. Additionally, leadership's individual financial performance, at least for the discretionary bonus component, is clearly driven in substantial part by the financial performance of the company, not safety. This imbalanced weighting sends the wrong message. Compensation for leadership in the realm of Public Utilities requires a higher focus on employee and public safety. This SMS element also includes accountability and authority. While single-point accountability and specific facilitating authority is well defined in documents of corporate governance at CMA, references to shared accountability are confusing. Responsibility for tasks and activities may well be shared but accountability belongs to a person -- only one person -- and that individual must have the necessary authority defined to effectively execute the task or activity. Finally, the Monitor's review of numerous surveys at CMA/NiSource have consistently provided results indicating a greater need for improvement in areas related to employee perceptions of Leadership Actions, Continuous Improvement, Strategic Commitment to Safety, Change Management and Communication.[30]

- Risk Management. CMA has made reasonable progress, chiefly through its Safety Compliance and Risk Management Division, to implement the CAP-based risk assessment and management process. The CAP tool includes a smart phone/computer application that has been made available to CMA employees to report issues and circumstances that they perceive

[30] These surveys include the 2019 CMA Safety Cultural survey, NiSource SMS Pulse Survey, Dashboard surveys for Leader Key Actions and SMS Element Maturity Journey Self Assessments for Leadership and Management Commitment

may pose risk. A more manual process is available to allow reports by contractors. These CAP reports are reviewed by CMA's two State SMS Leads who coordinate the formal risk assessments that are presented to the State Risk Table (a CMA committee chaired by the COO) for prioritization. The risk assessments of the State Risk Table drive the construction and maintenance of the CMA Risk Register which quantitatively prioritizes the risk reports. The most recent Risk Register reviewed by the Monitor consisted of 346 CAP reports, including 75 that had been rated as "high risk". CAP reports collected at the CMA level are also shared and reviewed by NiSource where they are combined with assessed risks from other NiSource companies and reviewed by the Gas Segment Risk Table. CMA also approaches risk assessment/risk management through its long-established Distribution Integrity Management Plan (DIMP) required by Federal regulations. The DIMP program is the responsibility of the NiSource Safety Management and Engineering organization. The program is implemented by a DIMP Coordinator and a DIMP Steering Team supported by subject matter experts to identify threats, evaluate and rank risks and implement measures to address risks. NiSource and CMA officials have informed the Monitor that the risk assessment/management processes associated with SMS/CAP and DIMP are not yet well integrated; however, progress has been made toward that goal

- Operational Controls. While the NiSource SMS Standard describes a Management of Change process that is intended to be *"utilized when technology, equipment, procedural, or organizational changes are being considered"*, the formulation of a formal MOC procedure has not been completed. A draft of the formal NiSource MOC procedure dated August 27, 2020 has been provided to the Monitor. This document identifies the classes of change addressed by the MOC process (Organizational, Physical, Procedural & Technological), defines roles and responsibilities of MOC initiators and reviewers, and announces the establishment of an MOC Review Board at the NiSource level. The document also includes a 3-page MOC Review Request that is intended to be used starting in October 2020. NiSource intends to create a MOC application similar to CAP to replace the paper review forms by the end of 2020 (well after the expected transition of CMA to Eversource). The formal MOC procedure and its associated training has not yet been rolled out to CMA and the Monitor has been advised by the COO that if the sale closes, leadership plans to adopt the existing Eversource Energy MOC process rather than a NiSource process, although it is not yet known what that procedure will be.

- Emergency Preparedness and Response. Emergency Response and Emergency Preparedness are two separate activities. Emergency Response is largely a state-based program supporting state regulatory requirements. Emergency Response deals with the "on the ground" tactical response to an incident. Emergency Preparedness serves to provide response planning, response capability, resources, organizational structure and incident scalability. CMA has improved its response capability since the Merrimack Valley accident by increasing training exercises, providing more ISO and FEMA training and certification, defining and designating employees to staff ICS positions, commissioning a mobile command capability, and establishing critical component inventory capability ("Red Bin"). NiSource has further benefited through enhanced planning, multijurisdictional training exercises and resulting lessons learned, the creation of an EPRP and the creation of an Emergency Response and Preparedness Team all within NiSource. Issues of concern to the Monitor relate to gaps in experience at the IC Command and Staff levels during large, complex, multijurisdictional incidents, especially in the early stages of such an event.[31]

[31] The Monitor did not evaluate Eversource's capabilities in Emergency Response nor is the Monitor familiar with arrangements, if any, that were made between NiSource and Eversource to provide support services during the transition.

The Monitor team's assessment of these selected elements is consistent with NiSource's self-assessment of its SMS maturity across all elements which indicates that its overall performance today is in the range of levels 2.0 to 3.0 (Developing-Implementing) on a scale of 5. This is about the average level of the gas industry today. The Monitor notes the positive trend within NiSource to develop new processes and to expand existing ones to support safety at NiSource and CMA.[32]

5.3 Summary of Safety Culture Observations in Previous Reports

The following is a summary of the key observations related to Safety Culture that were reported in the Monitor's previous two reports.

- Leadership. The expectations that lead to a positive safety culture are *created* at the top of the organization, not merely supported by the top. While the leadership failed to prevent the safety lapses that led to the accident, and then failed to expedite corrective safety actions after the event, leadership is now clearly focused on improvement. NiSource recently appointed a replacement for the departure of CMA's previous President and COO with a highly experienced and qualified executive noted for his passion and effectiveness of implementing safety -- a positive development for CMA and a compatible pairing with the company's current Chief Executive Officer who was brought in last year to guide CMA through its transition. However, while the words, slogans and, in most cases, the processes are in place at CMA, the workforce lacks clarity of objective, alignment with the concept of a safety culture and clear communication to explain what it all means. For example, cash-based incentive awards for the officer participants are based on a formula tied to 75% for corporate financial performance and 10% for safety. This could send mixed signals to employees regarding the companies' actual primary objectives. In this regard, it is the Monitor's opinion that a positive safety culture at CMA has existed mostly in the form of words and slogans rather than in its functional application and organizational understanding.

- Accountability: Documents and standards do not adequately support the standardization and effective application of the terms and concepts regarding accountability, responsibility and authority, and the consequences associated with them. Authority commensurate to accountability is a requirement to promote safety. Survey results and assessment date indicates that the workforce is unclear about what accountability means – to whom and for what – and about the authority to act.

- Performance Goals: Existing performance goals are not well developed within CMA. While CMA's corporate goals are appropriately defined by Leadership, the corporate *safety goals* have not been effectively cascaded down within the organization in a line-of-sight manner with employee involvement. The safety goals are not specific to each level/employee resulting in goals they do not own and for which they are not accountable. Additionally, the measurement of individual performance relative to these goals is not possible.

- Safety Performance Measurements. CMA safety metrics for past accident and injuries (i.e. "lagging" metrics) have improved substantially in 2020 as compared to 2018 and 2019 when the company was largely in the third quartile (i.e. lower half) in comparison with the

[32] The Monitor notes that after the Merrimack Valley accident, the DPU requested that all gas companies adopt API Recommended Practice 1173. According to the joint testimony of its CEO, Eversource was one of the first companies to begin piloting API Recommended Practice 1173 in 2016. In late April 2020, Eversource engaged TRC to assist in conducting assessments develop a plan to integrate the CMA PSMS into Eversource's program.

industry. CMA's use of "forward looking" safety indicators is in its early stages and will require much more validation and experience to be of value to improve safety.

- Responses to "Are all injuries/accidents avoidable?": The Monitor team obtained a significant and consistent level of opinion derived from interviews with employees, who responded to the simple question: *"Are all injuries/accidents avoidable?"* The feedback produced an almost equal split of opinion with half stating "yes" and half stating "no". The "no" responses are almost always explained by citing exceptions such as human factors ("people will make mistakes") or acts of God. When presented with the alternative view as follows: *"Ought all injuries and accidents be avoidable … if experience, training or supervision was better … or if employees possessed a strong work ethic… or if risk management considered the potential for storms, earthquakes and other categorical acts of God and strove to design and build facilities to mitigate damage and drove company values for a cause that was greater than themselves?*," the responses were almost universally "yes". As discussed previously, the importance that everyone should be aligned in their beliefs, values and goals is critical. In this case, what everyone is answering: *"Yes, all injuries and accidents ought to be avoidable, if we do what needs to be done."*

6.0 Conclusions and Perspectives from the Monitor

- The Monitor's total body of work is reflected in this document. It is the culmination of work which began with the development of its Semiannual Work Plan and continued with the publication of two Monthly Reports issued in July and August. This document constitutes both the Monitor's Monthly Report for September as well as a Summary Report for the entire period of the Monitor's engagement. Results of the Monitor's work are also reflected in the following: Issuance of an "Alert Report" to the Committee addressing inaccurate drawings; resolution of a Monitor-identified gap at CMA with regard to ensuring the availability of an experienced incident commander should a large-scale emergency occur; directing attention to the priority of resolving potential hazards associated with in-home gas regulators; and the prompting of communications of concerns from CMA's employee unions.

- Leadership failed to prevent the safety lapses that led to the accident, and then failed to expedite corrective safety actions after the event. The Monitor notes that now, after two years and many reports with recommendations, some safety gaps identified from the Merrimack Valley accident have not yet been closed. However, the Monitor has been encouraged by CMA's new leadership efforts to address these identified safety concerns.

- The Monitor's obligations were limited to oversight of CMA as per the Plea Agreement and Work Plan. In the performance of this oversight, the Monitor's report shows that certain safety deficiencies exist at CMA as a result of the governance by the parent company.

- The responsibility for overseeing the day-to-day operations of CMA rests with the Massachusetts Department of Public Utilities (DPU), and that this oversight -- not the Monitor's oversight -- will remain after the Sale of CMA. While only the Government Committee can rely on the Monitor's reporting, it is the Monitor's hope that the DPU will reference the Monitor's work to inform its safety oversight of the successor owner/operator of the CMA Assets, including if and as acquired by Eversource Energy.

- Safety costs a lot of money. Money is required to pay the salaries of safety professionals, incentivize safety for executives and staff, develop solid training programs, procure emergency supplies and implement recommendations to improve safety. It costs money because safety should be the most important priority in any transportation industry's business. However, in the public domain, the cost of safety *failures* can easily become enterprise threatening. Restitution for injury or loss of human life, fines, penalties, litigation, compliance requirements, and the indirect cost of committing untold internal resources to address the aftermath will always end up costing the company, its stakeholders and customers far more in real and intangible ways than would have ever been required had corporate leadership committed greater resources and focus on safety initially and continuously. A review of sentencing documents, annual financial reports and other records related to the Merrimack Valley accident reveals that CMA/NiSource has paid well in excess of $1 billion thus far. This includes $820 million for claims of those affected (property damage, restoration costs, etc.), $143 million to settle class actions, $53 million in a settlement fee to the DPU, $56 million in a criminal penalty, $206 million in environmental remediation. This does not include the approximate $360 million in expected pre-tax loss due to the sale of CMA, the salaries of hundreds of CMA and NiSource employees who have spent months of their time dedicated to restoration effort, and other miscellaneous expenses, and the loss of value due to the negative effects on goodwill (i.e. loss of reputation for the company's brand).

- As noted in the Work Plan, the Monitor is not responsible for day-to-day oversight and is in no way liable for any safety incidents or accidents that occur at any time related to any successor owner/operator of the Assets. Additionally, the Monitor has fulfilled its obligations with respect to the Court-ordered oversight in filing this report and any supplemental report requested by the Court, and is not liable for the manner in which its reports are subsequently used by any people or entities, including governmental entities, and without limitation of the foregoing and pursuant to the Work Plan, the actions of the Monitor and its findings shall not be used in any manner to support any enforcement action contemplated by the State of Massachusetts or its agencies, or otherwise.

- Based on the Court's order, it is the Monitor's understanding that its authority and tasking will be terminated upon the Court's approval of the Final Certification to be filed upon closing of the sale. The Monitor submits this report as its final report absent specific direction from the Court directing the Monitor to continue oversight and the related preparation of an additional monthly report for the month of October, provided that in the meantime, the Monitor will continue to work as outlined above.

- Finally, the Monitor and his entire team greatly appreciate the good cooperation, open communication and timely responses from the dedicated workforce at CMA and NiSource in support of the Monitor's duties. Every employee encountered by the Monitor and his team were professional, knowledgeable, and engaged. The team wishes to specifically recognize Ms. Lisa Hurley for her hard work and outstanding efforts as the CMA Liaison to the Monitor.

Appendix A:

Biographies of the Monitor

Monitor Team

for Columbia Gas of Massachusetts

James E. Hall
Managing Partner, Hall & Associates

Jim Hall is a leading expert in crisis management and government relations, and transportation safety and security, having served government and private clients for more than five decades.

Mr. Hall began his career in Washington as a member of the staff of Senator Albert Gore, Sr. (D-TN). He subsequently served as a counsel to the Senate Subcommittee on Intergovernmental Relations under Senator Ed Muskie. He maintained a private legal practice in Chattanooga, Tennessee, before serving in the cabinet of Tennessee Governor Ned McWherter. Mr. Hall served as director of the state's Planning Office for five years. As such he was responsible for overseeing the establishment of the Memphis Headquarters for FedEx, the internationally recognized shipping company. In addition to overseeing this large initiative, Mr. Hall handled policy planning and special projects, including heading up planning for the State's Bicentennial Celebration. It was Hall's initiative that resulted in the construction of the Bicentennial Mall in Nashville, one of the city's newest crown jewels.

Hall returned to Washington, D.C. to serve as Chief of Staff for Senator Harlan Mathews (D-TN). In 1993, Mr. Hall was nominated by President Clinton to be a Member of the National Transportation Safety Board, and to serve as its Chairman in 1994. He led the Board through January 2001.

During his chairmanship, Mr. Hall worked tirelessly to improve safety in all modes of transportation in the U.S. and abroad. He visited more than 30 nations as Chairman, and oversaw a period of unprecedented activity as the NTSB investigated numerous major aviation, rail, pipeline and maritime accidents in the U.S. During his tenure on the Board, Mr. Hall also assisted in many international accident investigations. Among the major investigations the NTSB conducted while Mr. Hall was Chairman were the aviation cases of USAir 427, TWA 800, and EgyptAir 990; the Olympic Pipeline accident in Bellingham, Washington; the AMTRAK crash in Bourbonnais, Illinois; and a Carnival Cruise Line fire near Miami. In 1996, President Clinton named Mr. Hall to the White House Commission on Aviation Safety and Security.

Under Chairman Hall's leadership, the NTSB issued landmark safety studies on commuter airlines, the air tourism industry, the performance and use of child restraint systems, personal watercraft, transit bus operations, passive-grade railway crossings and the dangers posed to children by passenger-side airbags in automobiles.

Hall has for many years been Vice Chairman of the Chattanooga Metropolitan Airport Authority. Mr. Hall is a former member of the Board of Trustees at the University of Tennessee and the Board of the UC Foundation, and a former member of the Tennessee River Gorge Trust. He was also the Chairman of the Enterprise Center in Chattanooga for eight years, a board member of U.S. Xpress Enterprises, and served on the National Academy of Engineering's Committee on Combating Terrorism and the Aviation Institute Advisory Board of George Washington University. In addition, Mr. Hall served as a member of the External Advisory Board of BP America PLC.

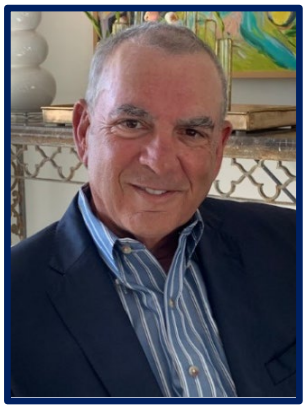
These diverse experiences and responsibilities give him the ability to work with clients on a wide range of issues. At Hall & Associates, Mr. Hall has surrounded himself with people who share his extensive knowledge on a broad range of issues, and he has created an environment conducive to helping our clients with whatever needs they have.

In addition, Mr. Hall serves as an adviser to governments and private clients on transportation safety and security, crisis management and government relations. He is a frequent speaker at industry events, an oft-quoted expert source by television and print reporters, and an author of numerous Op-Ed pieces. His columns have appeared in national publications such as *the New York Times* and *USA Today,* and regional newspapers like the Virginian Pilot in Norfolk. He has appeared on virtually every major television news program, including *60 Minutes*, the *Today* show, *Fox Business Channel*, *BBC, MSNBC, CNN and CNBC*. In 2002, the U.S. Forest Service named Mr. Hall to co-chair a blue-ribbon safety review of the operations of firefighting aircraft after three such aircraft crashed that summer.

Mr. Hall has given congressional testimony before numerous House and Senate committees, including the House Committee on Transportation and Infrastructure (aviation and railroad subcommittees) and the Senate Committee on Commerce, Science and Transportation (transportation and surface transportation/merchant marine subcommittees).

Mr. Hall graduated from the University of Tennessee School of Law in 1967, following the receipt of a baccalaureate of legal letters degree from the undergraduate school. He also has an honorary degree in public service from George Washington University for his outstanding leadership and commitment to the public. He served as a commissioned officer in the U.S. Army from 1967 to 1973, receiving the Bronze Star for Meritorious Service in Vietnam in 1969.

William D. Scott II



Mr. Scott is a highly respected expert and consultant with over four decades of significant contributions to public and private firms in transportation, logistics, energy, alternative energy, utilities and consumer products manufacturing. He has a proven track record as an executive and problem solver who has represented and advised Federal agencies regarding regulatory affairs and compliance for security, safety, transportation, and energy management issues.

As an expert with Hall & Associates for the past nine years, Mr. Scott has provided valuable expertise regarding pipeline operations and safety. For example, he consulted with Pacific Gas and Electric Co (PG&E) following the company's pipeline failure in San Bruno, California in 2010. His efforts contributed to recommendations and counsel to PG&E's Board of Directors and Executive Management to improve pipeline safety and create a robust safety culture, and he also assisted counsel for the California Public Utilities Commission.

Prior to consulting, Mr. Scott served as the president of Temple Mountain Energy in Vernal, Utah from 2007 to 2009. He was elected by the Board of Directors as president to launch the first-ever operational oil sands pilot plant in U.S., using innovative and proprietary technology to enable cost-effective and environmentally sensitive oil production. From 2006 to 2007, he also served as the Vice President of Operational Excellence for Georgia Pacific, a Fortune 500 company headquartered in Atlanta, Georgia. There he was tasked to lead a board-driven 18-month strategic assignment to design a transformation plan to reconstruct global supply chain and logistics.

Mr. Scott was also previously employed by the Colonial Pipeline Company in Atlanta for nearly 10 years beginning in 1998, as a senior vice president and its Chief Operating Officer. He was recruited by the CEO in a post-crisis climate to embark on an operational and cultural turn-around mission to reform operational errors, restore operational integrity, and raise value/equity. He directed senior managers and 550 employees in the areas of operations, engineering, aviation, automation, control systems, safety/security, and training. Mr. Scott successfully led a cultural shift from entitlement and risk avoidance to accountability and risk management. He restored operational integrity at the company, reversing from worst to first for a no. 1 ranking industrywide. Colonial received the Association of Oil Pipe Lines (AOPL) Award for Best Pipeline Company five times during his tenure – an accomplishment never before matched. Mr. Scott himself also received an award from the U.S. Pipeline and Hazardous Materials Safety Administration (PHMSA) for industry leadership to advance the cause of pipeline safety.

Mr. Scott began his career with Conoco/Phillips -- the largest Integrated refining/marketing energy company in U.S – where he worked as a manager in marketing, business development, acquisitions and transportation from 1976 to 1998. During his 22-year tenure at Conoco/Phillips, Mr. Scott completed multiple domestic and international assignments with noted success. For example, he led a marketing team that won the President's Global Award for Safety.

Mr. Scott earned a B.A. in Management from Texas Tech University and a Masters Degree in Liberal Arts from Southern Methodist University. He has held chairman and leadership positions with numerous high-profile industry committees and boards.

Kevin B. Knapp

Mr. Kevin Knapp has accumulated nearly four decades of technical and executive experience in the gas and electric industry. He has consistently proven to be an invaluable expert, collaborative leader and an agent for safety change in every position he has held in the industry.

Mr. Knapp began his career in 1973 as Field Inspector (IBEW) for Long Island Lighting Company (LILCO). He progressed through First Line Supervisor and Manager for Gas Operations at LILCO before leaving in 1984 to accept the position as Chief Gas Distribution Engineer of Manhattan Gas Operations for Consolidated Edison. He returned to LILCO in 1990 as Division Manager of Gas Operations and was quickly promoted to Department Manager of Transportation and then to Department Manager of Gas Customer Service.

Because of his demonstrated ability to successfully resolve challenging issues, Mr. Knapp was then asked to lead LILCO's day-to-day merger efforts with Brooklyn Union Gas to form KeySpan Energy. He later served a similar role in the merger with Eastern Enterprise. KeySpan is a regulated natural-gas utility holding company that operates in New York City, Long Island, Boston, and part of New Hampshire. It is the fifth-largest gas utility in America and the largest gas utility in the Northeast, with about 2.6 million customers.

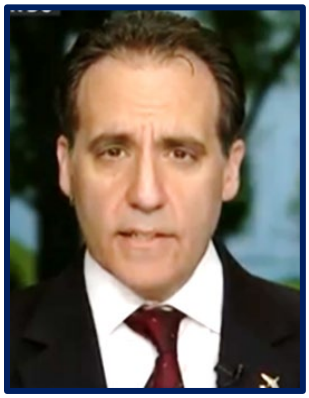
In 1999, Mr. Knapp served as the Director of Electrical Generation for the KeySpan Corporation and was quickly promoted to Vice President at KeySpan's Long Island Gas Operations in 2000. In 2002, Mr. Knapp was reassigned as the Vice President of Keyspan's New England Gas Operations and achieved success for each of the five years he was employed there.

Mr. Knapp was then appointed as the Senior Vice President of U.S. Supply Chain at National Grid in 2007 where he was responsible for U.S. Supply Chain activities including: Procurement & Accounts Payable ($1.5 billion); Inventory Management ($100 million); and Fleet Operations (10,000 units).

In March 2012, Mr. Knapp was named Vice President of Gas Transmission and Distribution Operations for the Pacific Gas and Electric Company (PG&E) in San Francisco, California. He was responsible for the operations and maintenance on PG&E's gas transmission and distribution system, including leak survey and repair, corrosion testing/remediation, pipeline patrolling, and emergency response calls. Mr. Knapp was hand-picked for this assignment to help improve PG&E's operations and safety culture following the 2010 gas pipeline explosion in San Bruno, California.

Following numerous successful achievements at the company, Mr. Knapp retired from PG&E, relocated back to the northeastern U.S. and currently consults in the gas industry. Mr. Knapp earned a B.S. degree in Industrial Engineering from Hofstra University, and a M.S. degree in Industrial Engineering at Columbia Engineering.

Jeffrey B. Guzzetti



Molded by over 35 years of safety analysis and accident investigation experiences, Jeff Guzzetti has become a sought-after safety consultant, instructor, investigator, surveyor, and writer. Current activities include instructing at the University of Southern California (USC) Aviation Safety Program, conducting safety surveys of air ambulance operations for the Commission of the Accreditation of Air Transport Systems (CAMTS), writing articles related to safety culture in maintenance, and consulting with various transportation operations to improve safety.

Mr. Guzzetti began his career with the Federal Aviation Administration (FAA) in 1985 as an aerospace engineer at the FAA Technical Center's Aviation Safety Division in New Jersey. He later held positions in systems safety engineering for the U.S. Naval Air Systems Command and in air safety investigations with the Cessna Aircraft Company. While at Cessna, Mr. Guzzetti traveled to accident sites across the U.S. to assist FAA inspectors and National Transportation Safety Board (NTSB) investigators by providing technical expertise on all Cessna aircraft.

Mr. Guzzetti was then recruited by the NTSB in 1992 and worked in the agency's Office of Aviation Safety for 18 years -- first as a field investigator, then as a systems engineer for the NTSB "go-team," and later as an investigator-in-charge (IIC) of major accidents and incidents. He led key aspects of many notable investigations including the Alaska Airlines Flight 261 crash in California and the JFK Jr. Piper PA-28R accident. Mr. Guzzetti was then promoted to Deputy Director for Regional Operations in 2002 and was responsible for overseeing the NTSB's investigation of 1,600 general aviation accidents each year.

In August 2010, Mr. Guzzetti left the NTSB to accept an appointment as the Assistant Inspector General of Aviation and Special Program Audits at the Department of Transportation's (DOT) Office of Inspector General (OIG). There he provided executive-level oversight of 90 auditors and staff at DOT Headquarters and three of its regional offices who conducted formal audits of programs that were overseen by the Pipeline and Hazardous Materials Safety Administration (PHMSA) as well as the FAA. The "Special Programs" portion of his title referred to the entire portfolio of pipeline and hazardous material safety issues under the purview of PHMSA.

Mr. Guzzetti testified before Congress several times regarding transportation safety programs. He was responsible for the office's training, budget, and pipeline safety audit topic agenda. He represented the agency in all interactions with the PHMSA Administrator, his/her senior staff, and Congressional staff responsible for oversight and appropriations of PHMSA operations. Mr. Guzzetti was responsible for the issuance of 42 audit reports on PHMSA and FAA programs including a report entitled *PHMSA's State Pipeline Safety Program Lacks Effective Management and Oversight* issued in May 2014.

In 2014, Mr. Guzzetti accepted an offer to serve as the director of FAA's Accident Investigation Division. This division was responsible for ensuring the integrity of policies and practices for FAA inspectors assigned to investigate aircraft accidents and incidents, and it also functioned as the primary liaison with the NTSB. The division employed an elite group of senior investigators to represent the agency in major air safety investigations worldwide. He retired from this position in February 2019.

Mr. Guzzetti earned a B.S. degree in Aeronautical Engineering from Embry-Riddle Aeronautical University in Florida. He is also a commercial-rated pilot with multi-engine instrument ratings in airplanes, seaplanes, and gliders.

Vernon S. Ellingstad, Ph.D.

Dr. Vern Ellingstad has extensive experience with national and international accident/incident databases in aviation, rail, highway, marine, and pipeline transportation modes, and the conduct of aggregate analyses of accident trends and causal factors. He has significant experience in all phases of transportation accident investigation, with particularly strong experience in human factors issues including operator fatigue, operator workload, and safety culture. Dr. Ellingstad also has extensive experience conducting statistical analysis of accident, survey, and outcome data in a wide variety of experimental, quasi-experimental, and observational research. His experience also includes large-scale program evaluation and systems research and significant involvement in developing and advocating for recommendations to improve the safety and efficiency of transportation systems.

As Chief Technical Advisor for Investigations and Research at the National Transportation Safety Board (NTSB) from 2009 to 2012, Dr. Ellingstad conducted studies of transportation safety issues using both prospective and retrospective accident investigation data, and assessments of government and industry risk management and safety efforts. He also provided scientific and technical review of most major accident reports issued by the NTSB and advised senior management on accident investigation and transportation safety policy issues, including those involving gas pipelines.

As Deputy Director and Director of the Office of Research and Engineering from 1990 to 2009, Dr. Ellingstad managed the NTSB laboratory and applied research facilities to support accident investigations and safety research in all transportation modes. These facilities include the Materials Laboratory, the Vehicle Recorders Laboratory, and the Vehicle Performance Laboratory. The Office of Research and Engineering also included the Safety Research and Statistical Analysis division, which manages the Board's census of U. S. civil aviation accidents, conducts statistical reviews of these data, and conducts both long- and short-term safety studies that explore significant safety issues.

As Assistant to Full Professor of Psychology at the University of South Dakota from 1969 to 1990, Dr. Ellingstad taught a variety of courses at the graduate and undergraduate levels and directed more than 30 Ph.D. dissertations and 40 M.A. theses. He also administered the M.A. and Ph.D. programs in Human Factors Psychology, and managed the Human Factors Laboratory and solicitation and conduct of external research grants and contracts to support human factors research in this facility. Personal Human Factors research efforts included studies of operator fatigue, studies of alcohol and drug effects on driving performance and risk taking, studies of motorcycle training and helmet use, and studies of a range of cognitive and human-computer interaction tasks.

Dr. Ellingstad also served as Chairman of the University of South Dakota Department of Psychology from 1986 to 1990 and Director of the South Dakota Research Institute from 1978 to 1982.

Dr. Ellingstad received his BA degree from the Wisconsin State University at Eau Claire and his M.A.) and Ph.D. degrees from the University of South Dakota. He received the 1997 *Arthur S. Flemming* Award for outstanding men and women in the Federal Government (Applied Science) in 1998 and the U.S. Government Senior Executive Service *Presidential Rank Award* in 1999.

Appendix B:

NTSB Safety Recommendation Report

National Transportation Safety Board
Washington, DC 20594

Safety Recommendation Report

Natural Gas Distribution System Project Development and Review (Urgent)

Ongoing Investigation

On September 13, 2018, about 4:00 p.m. eastern daylight time, a series of explosions and fires occurred after high-pressure natural gas was released into a low-pressure gas distribution system in the northeast region of the Merrimack Valley, Massachusetts. The distribution system was owned and operated by Columbia Gas of Massachusetts (Columbia Gas), a subsidiary of NiSource, Inc. The system overpressure damaged 131 structures, including at least 5 homes that were destroyed in the city of Lawrence and the towns of Andover and North Andover. Most of the damage was a result of structure fires ignited by gas-fueled appliances. Several structures were destroyed by natural gas explosions. One person was killed and at least 21 individuals, including 2 firefighters, were transported to the hospital. Seven other firefighters received minor injuries.

The cast-iron, low-pressure natural gas distribution system was installed in the early 1900s and had been partially improved with both steel and plastic pipe upgrades since the 1950s. The low-pressure distribution system in the affected area relied on 14 regulator stations to control natural gas at the required pressure into structures serviced by the system. Each of the regulator stations reduced the natural gas pressure from about 75-pounds per square inch, gauge (psig) to about 12 inches of water column (about 0.5 psig) for delivery to customers.[1]

Prior to the accident, Columbia Gas had an overarching plan consisting of multiple projects to replace 7,595 feet of low-pressure, existing cast-iron and plastic natural gas main with 4,845 feet of low-pressure and high-pressure plastic gas main on South Union Street and neighboring streets.

On September 13, prior to the overpressure event, a Columbia Gas-contracted work crew, which included a Columbia Gas inspector, executed one of the Columbia Gas-designed and -approved pipe-replacement projects at the intersection of South Union Street and Salem Street in South Lawrence. The project was to install a plastic distribution main and abandon in place a cast-iron distribution main. The distribution main that was abandoned still had the regulator-sensing lines that were used to detect pressure in the distribution system and provide input to the regulators to control the system pressure. Once the contractor crews disconnected the distribution main that was being abandoned, the section containing the regulator-sensing lines began losing pressure.

[1] *Inches of water column* is a unit of pressure measurement that is typically used for low-pressure gas systems, such as a low-pressure natural gas distribution system.

As the pressure in the abandoned distribution main dropped about 0.25 inches of water column (about 0.01 psig), the regulators responded by opening further, increasing pressure in the distribution system. The regulators opened completely when they no longer sensed system pressure, allowing the full flow of high-pressure gas to release into the distribution system supplying the neighborhood. As a result, natural gas was delivered to customers at a pressure well above the maximum-allowable operating pressure which led to the ignition of fires and explosions in homes.

Minutes before the fires and explosions occurred, the Columbia Gas monitoring center in Columbus, Ohio, received two high-pressure alarms for the South Lawrence gas pressure system: one at 4:04 p.m. and the other at 4:05 p.m. The monitoring center had no control capability to close or open valves; its only capability was to monitor pressures on the distribution system and advise field technicians accordingly. Following company protocol, at 4:06 p.m., the Columbia Gas controller reported the high-pressure event to the Meters and Regulations group in Lawrence. A local resident made the first 9-1-1 call to Lawrence Emergency Services at 4:11 p.m.

In response, three technicians were dispatched to perform field checks on 14 regulators. Columbia Gas shut down the regulator at issue by about 4:30 p.m. The critical valves of the natural gas distribution system were closed by 7:24 p.m. Beginning about midnight, crews consisting of two Columbia Gas technicians escorted by two emergency response personnel began shutting off the meters at each house to isolate the homes from the natural gas distribution system. All meters were shut off by the following morning.

Engineering Work Package Approval Process

Omissions in the engineering work package and construction documentation for the project near South Union Street and Salem Street were discovered during the National Transportation Safety Board (NTSB) investigators' review. Although Columbia Gas used its project workflow process to develop, review, and approve the engineering plans, the work package did not include consideration of the existence of regulator-sensing lines within the scope of work—in particular, the regulator-sensing lines connected to the distribution lines that were slated to be abandoned. This omission was not identified by the Columbia Gas constructability review.

Constructability reviews are a recognized and generally accepted good engineering practice for the execution of professional design services and are intended to provide an independent and structured review of construction plans and specifications to ensure there are no conflicts, errors, or omissions.[2] The review should be performed by qualified professionals to identify deficiencies and incorporate improvements into the construction documents. Many jursidictions also require that plans be approved (sealed) by a professional engineer licensed to perform engineering in the jurisdiction.[3]

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[2] J.G. Kirby, R.P. Cannalte, D.K. Hicks, and E.J. Japel, *Constructability and Design Reviews: Analysis and Recommendations for Improvement*, US Army Corps of Engineers Constructional Engineering Research Library Technical Report P-89/15 (Washington, DC: US Army Corps of Engineers, 1989).

[3] (a) According to the National Society of Professional Engineers (NSPE), in order to use the PE seal, an engineer must earn a 4-year degree in engineering from an accredited engineering program, pass the Fundamentals of

According to the Columbia Gas project workflow process, a company field engineer is responsible for the development of design and engineering modifications to the pipeline system.[4] The plans are packaged as a project package that is circulated to other departments for the constructability review.[5] Columbia Gas requires the Engineering department and the Construction department to approve all projects, but the Land Services department and the Meter and Regulation department review the packages on an "as needed basis," depending on the project.

While the engineering design package for the South Union Street project underwent a constructability review, NTSB investigators found that the constructability review did not identify the impact on pressure regulation and control. The Columbia Gas field engineer who developed the engineering plans told NTSB investigators that he developed them without reviewing engineering drawings that documented the regulator-sensing lines.

The field engineer said that the Meter and Regulation department within Columbia Gas had the maps containing control line information and he was unaware if his department had access to such records. Furthermore, the field engineer had limited knowledge about the importance of the regulator-sensing lines or the consequences of losing the capability to sense the main pressure via the regulator-sensing lines. The constructability review records for the overarching South Union Street and Salem project indicate that the plans were seen and approved by the Engineering department and the Construction department. The Meters and Regulation department and the Land Services department were not required to review the project because the field engineer did not believe at the time that the proposed scope of work was applicable to or affected these departments.[6] The NTSB believes a comprehensive constructability review, which would require all departments to review each project, along with the seal of approval from a professional engineer (PE), would likely have identified the omission of the regulator-sensing lines, thereby preventing the error that led to the accident. By sealing the project plans, the PE takes responsibility for the accuracy and completeness of the engineering package. Neither the Commonwealth of Massachusetts nor Columbia Gas policy require a registered PE to develop or review public utility engineering plans.[7]

According to the National Society of Professional Engineers (NSPE), in most states PE's are not required to review and approve project plans, such as those used in this accident, because they have industrial, public utility, or other exemptions. The NSPE has advocated for the phasing out of existing industrial exemptions in state licensing laws. According to the NSPE:

Engineering exam, complete 4 years of progressive engineering experience under the guidance of a registered PE, and pass the Principles and Practice of Engineering exam. (b) The qualifications required for licensure as a PE in the United States are set by each jurisdiction through the state's engineering statute, and rules established by the state board of licensure of professional engineers implementing those statutory requirements. The law and the rules differ in each state.

[4] The field engineer was not a registered professional engineer.

[5] Columbia Gas often refers to the project package as a "pouch."

[6] The Columbia Gas Capital Design Job and Constructability Review Checklists allow the Engineering department to determine what departments outside of the Engineering and Construction departments review the project.

[7] Massachusetts Public Health Regulations, Title XVI, Chapter 112, Section 81R.

> [m]any engineers in industry have responsibility for activities that directly affect the public health, safety, and welfare. But exemptions place these individuals and organizations performing engineering services outside of the licensing system. Exempt individuals and organizations are not subject to the same legal and ethical requirements as those who are licensed.[8]

The NTSB believes that it is critical that an engineer with the appropriate qualifications and experience review engineering plans for a gas company, if not develop them. The Commonwealth of Massachusetts exemption for the requirement of PE licensure to perform "industrial" and public utility work foreclose an opportunity to detect this design oversight. The seal of a PE should be required on all public utility engineering plans to reduce the likelihood of accidents such as this occurring.[9]

The PE licensure is a regulatory instrument for advancing the public good, protecting employers and the public, and ensuring that the engineering work was performed consistent with a standard of care and in accordance with a strict code of ethics. A PE seal on a plan would illustrate that the plan had been approved by an accredited professional with the requisite skills, knowledge, and experience to provide a comprehensive review. Therefore, the NTSB recommends that the commonwealth of Massachusetts eliminate the professional engineer licensure exemption for public utility work and require a professional engineer's seal on public utility engineering plans. Additionally, the NTSB recommends that NiSource revise the engineering plan and constructability review process across all its subsidiaries to ensure that all applicable departments review construction documents for accuracy, completeness, and correctness, and that the documents or plans be sealed by a PE prior to commencing work.

Pipeline System Records

NTSB investigators also learned that the engineering plans used during the construction work did not document the location of regulator-sensing lines. A review of the engineering work package indicated that the location of the nearest regulator was identified on the plans and maps but did not indicate the location of the regulator-sensing lines.

Documentation and record-keeping are critical parts of a pipeline safety management system (PSMS) program. In fact, American Petroleum Institute Recommended Practice 1173, *Pipeline Safety Management Systems*, states in Section 14.1:[10]

> The pipeline operator shall maintain a procedure for the identification, distribution, and control of documents required by its PSMS. The procedure shall specify responsibilities for document approval and re-approval and shall identify the

[8] NSPE, *Industrial Exemption*, https://www.nspe.org/sites/default/files/IndustrialExemptionFINAL2017.pdf, accessed October 23, 2018.

[9] The seal of a PE signifies that the document has been developed or reviewed by an individual who has met the necessary prerequisites of engineering education, experience, and examination.

[10] American Petroleum Institute, *Pipeline Safety Management System Requirements*, API Recommended Practice 1173, First edition, July 2015 (Washington, DC: American Petroleum Institute, 2015).

> controls needed to assure that the documents required by the PSMS, including revisions, translations, and updates:
>
> a) are reviewed and approved for adequacy prior to issue and use;
> b) identify changes and revision status;
> c) remain legible and readily identifiable; and
> d) are readily available and accessible to workers performing an activity.
>
> Obsolete documents shall be removed from all points of issue or use, or shall otherwise be identified to assure against unintended use if they are retained for any purpose.

Had accurate alignment sheets with comprehensive system information been available and used during the construction project, engineers and work crews would have been able to identify the regulator-sensing lines and ensure their relocation prior to abandoning the pipeline main.[11] Therefore, the NTSB recommends that NiSource review and ensure that all records and documentation of its natural gas systems are traceable, reliable, and complete.

Management of Change

Columbia Gas's implementation of management of change (MOC) is limited to the management of its Distribution Integrity Management Plan (DIMP), a program required by Pipeline and Hazardous Materials Safety Administration (PHMSA) regulations to enhance safety by identifying and mitigating risks that could cause serious consequences to the integrity of the pipeline system." Columbia Gas does not practice MOC for managing maintenance and construction changes to pipeline operations. Engineering department personnel rely upon checklists within its workflow documentation to manage change within the work packages generated through the department.

NTSB interviews of Columbia Gas managers and staff revealed that the company did not conduct separate risk assessments for each construction project. Performing risk assessments and developing risk mitigation plans or procedures are critical components of in a PSMS program. API RP 1173 states in Section 8.4.1:[12]

> The pipeline operator shall maintain a procedure for management of change (MOC). For each MOC, the pipeline operator shall identify the potential

[11] The alignment sheet is a document that represents the "as built" location of the pipeline and includes the description of the pipe laid. The pipeline is typically represented as a single line or centerline and typically drawn to scale. The description will include the outside diameter of the pipe, grade, weight-per-foot, and wall thickness, as well as the type of connection used to join the individual lengths or joints of pipe. The sheet may indicate whether the land is forest or in cultivation. Stations along the pipeline indicate distance from the starting point to that "station" and are reference points, as there also will be various crossings designating oil and gas pipelines of varying sizes, water lines, sewer lines, and underground cables, etc. Other topographical features might be listed as well such as the type of soil, hilly, rolling hills, and wetlands, etc.

[12] American Petroleum Institute, *Pipeline Safety Management System Requirements*, API Recommended Practice 1173, First edition, June 2014 (Washington, DC: American Petroleum Institute, 2014).

risks associated with the change and any required approvals prior to the introduction of such changes.

MOC procedures require an analysis of implications, among several other elements. Additionally, a risk identification and assessment are necessary to establish the appropriate prevention and mitigation measures to reduce the likelihood of consequences should an incident occur. Columbia Gas failed to perform such an analysis and failed to establish appropriate controls to mitigate the risks of the work that was being performed.

NTSB investigators also learned that, until about 4 years ago, Columbia Gas required that a technician monitor any gas main revision work which required depressurizing the main. The technician—typically from the Meter and Regulation department—would use a gauge to monitor the pressure readings on the impacted main and would communicate directly with the crew making the change. If a pressure anomaly occurred, the technician could quickly act to prevent an overpressurization action. Columbia Gas offered no explanation as to why this procedure was phased out. Although the Columbia Gas monitoring center in Columbus, Ohio, received high-pressure alarms and reported the event to the Meters and Regulations department 2 minutes after receiving the first alarm, there were no technicians prestaged or positioned to immediately close valves when the overpressurization occurred.

Had Columbia Gas adequately performed MOC and placed personnel at critical points along the system, Columbia Gas could have immediately addressed the issue and mitigated the consequences of the event.

Therefore, the NTSB recommends that NiSource apply management of change processes to all changes to adequately identify system threats that could result in a common mode failure. Additionally, the NTSB recommends that NiSource develop and implement control procedures during modifications to gas mains to mitigate the risks identified during MOC operations. Gas main pressures should be continually monitored during these modifications and assets should be placed at critical locations to immediately shut down the system if abnormal operations are detected.

B6

Recommendations

As a result of this report, the National Transportation Safety Board makes the following safety recommendations:

To the Commonwealth of Massachusetts:

Eliminate the professional engineer licensure exemption for public utility work and require a professional engineer's seal on public utility engineering drawings. (P-18-005)

To NiSource, Inc.:

Revise the engineering plan and constructability review process across all of your subsidiaries to ensure that all applicable departments review construction documents for accuracy, completeness, and correctness, and that the documents or plans be sealed by a professional engineer prior to commencing work. (P-18-006) (Urgent)

Review and ensure that all records and documentation of your natural gas systems are traceable, reliable, and complete. (P-18-007) (Urgent)

Apply management of change process to all changes to adequately identify system threats that could result in a common mode failure. (P-18-008) (Urgent)

Develop and implement control procedures during modifications to gas mains to mitigate the risks identified during management of change operations. Gas main pressures should be continually monitored during these modifications and assets should be placed at critical locations to immediately shut down the system if abnormal operations are detected. (P-18-009) (Urgent)

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

ROBERT L. SUMWALT, III
Chairman

BRUCE LANDSBERG
Vice Chairman

EARL F. WEENER
Member

T. BELLA DINH-ZARR
Member

JENNIFER HOMENDY
Member

Adopted: November 14, 2018

Appendix C

Excerpts of DPU Consent Order
and CMA Responses

The Commonwealth of Massachusetts

DEPARTMENT OF PUBLIC UTILITIES

CONSENT ORDER

August 14, 2020 D.P.U. 19-140

In the matter of Bay State Gas Company d/b/a Columbia Gas of Massachusetts

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I. JURISDICTION

1. This document, with the violations outlined in the attached Exhibit A, is a Consent Order entered into between the Pipeline Safety Division ("Division") of the Department of Public Utilities ("Department") and Bay State Gas Company d/b/a Columbia Gas of Massachusetts ("Respondent"), and is executed in accordance with 220 CMR 69.08.
2. The Division has authority to enter into this Consent Order on behalf of the Department pursuant to Delegation Order, D.P.U. 18-44-A (2017).
3. Failure to comply with the terms of this Order may result in the assessment of civil penalties and referral of this matter to the Attorney General for appropriate action.
4. The terms and conditions of this Order become effective upon signing by the authorized representatives of the Respondent and the Department.
5. Respondent has stipulated and consented to the issuance of this Consent Order.

II. VIOLATIONS AND CIVIL PENALTY

1. Pursuant to G.L. c. 164, §§ 76 and 105A, and 220 CMR 69.02, the Division conducted pipeline safety inspections of the Respondent's facilities and records regarding various investigations. The formal matters encompassed by this Consent Order and the violations pertaining to each matter are referenced in Exhibit A, attached hereto.
2. Based on the information obtained, the Division finds that the Respondent violated pipeline safety regulations contained in 49 C.F.R. Part 192 ("Part 192"), 49 C.F.R. Part 193 ("Part 193"), the Massachusetts General Laws, and the Department's Pipeline Safety regulations, as set forth in Exhibit A.
3. In Joint Petition of Eversource Energy, NiSource Inc., Eversource Gas Company of Massachusetts, and Bay State Gas Company d/b/a/ Columbia Gas of Massachusetts, D.P.U. 20-59 (pending), NiSource Inc., the Respondent's ultimate parent company, has agreed to a payment in lieu of penalties of $56 million as part of a Settlement Agreement to resolve, among other things, all matters specified in Sections 2.25.2, 2.25.3 and 2.26

of the Settlement Agreement.1 Of this amount, $12 million resolves all compliance actions associated with D.P.U. 19-140, or otherwise pending at the Division against NiSource, the Respondent and its affiliates, and all of the respective directors, officers, employees, agents and representatives ofNiSource, the Respondent and its affiliates, as of July 2, 2020, including the violations noted in Exhibit A.

4. The Compliance Agreement between the Division and Bay State Gas Company is included herewith and is part of this Consent Order.

5. The terms of the payment in lieu of penalties are set forth in the Settlement Agreement (Section 2.27) and the Settlement Agreement resolves all issues associated with this payment made in lieu of penalties.

III. RESPONDENT REQUIREMENTS

1. **Respondent shall sign the Stipulation below and return this complete document to the Division by August 14, 2020.**

2. All submissions by Respondent in accordance with this Consent Order shall be addressed to:

Director
Pipeline Safety Division
Department ofPublic Utilities
One South Station
Boston, MA 02110

IV. STIPULATED TERMS

Pursuant to 220 CMR 69.08(1), the Respondent through the signature below, by the person to whom this Consent Order is issued or a duly authorized representative, acknowledges agreement to the terms contained herein without admitting or denying that a violation of any Department or federal pipeline safety law or regulation occurred in relation to the above-noted matters. Further, Respondent agrees to issuance of this Consent Order and stipulates to the following:

I. Respondent, by signing the Stipulation, hereby waives:

(a) All rights to informal review pursuant to 220 CMR 69.05;

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1 The Settlement Agreement is entered into by and among Bay State Gas Company d/b/a Columbia Gas of Massachusetts ("Bay State Gas"), and its holding company parent, NiSource Inc. ("NiSource"), Eversource Gas Company of Massachusetts and its holding company parent, Eversource Energy ("Eversource"), the Massachusetts Attorney General's Office, the Massachusetts Department of Energy Resources, and the Low-Income Weatherization and Fuel Assistance Program Network with regard to the proposed sale by NiSource and Bay State Gas, and acquisition by Eversource, of the business of Bay State Gas.

(b) All rights to a hearing pursuant to 220 CMR 69.06;

(c) Any and all procedural rights available in connection with the issuance of the Consent Order;

(d) All rights to seek any type of administrative or judicial review of the Consent Order; and

(e) Any and all rights to challenge or contest the validity of the Consent Order.

2. Respondent expressly acknowledges that neither Respondent nor the Division has any intention to enter into a contract.

3. The terms and provisions of this Consent Order, Compliance Agreement and Stipulation shall be binding upon, and inure to the benefit of, Respondent and the Division and their successors in interest.

4. Nothing in these Stipulated Terms shall preclude any proceedings brought by the Department to enforce the terms of the Consent Order or Compliance Agreement, and nothing in these Stipulated Terms constitute, nor shall Respondent contend that they constitute, a waiver of any right, power, or authority of any other representative of the Commonwealth or an agency thereof to bring other actions deemed appropriate.

V. FINAL ORDER

I. This Consent Order, Compliance Agreement and Stipulation are intended to be, and shall be construed to be, a final order of the Department issued pursuant to G.L. c. 25, § 5, having the force and effect of a remedial order, pursuant to 220 CMR 69.07(2), and expressly does not form, and may not be considered to form, a contract binding on the Division, the Department, or the Commonwealth of Massachusetts.

2. The terms of this Consent Order, Compliance Agreement and Stipulation, including this paragraph, are not subject to amendment or modification by any extraneous expression, prior agreement, or prior arrangements between the Division and the Respondent, whether oral or written.

By Order of the Division

P (1t1cc:tptr-SYJ Date: 8/14/20
Richard Enright, Director
Pipeline Safety Division
Department of Public Utilities

The undersigned, duly authorized, stipulates to and acknowledges agreement to the terms herein.

BAY STATE GAS COMPANY d/b/a Columbia Gas of Massachusetts

Date: 8/14/20
Jame /w<if'-.-
Chief Operating Officer

COMPLIANCE AGREEMENT
BETWEEN THE DEPARTMENT OF PUBLIC UTILITIES
AND BAY STATE COMPANY D/B/A
COLUMBIA GAS OF MASSACHUSETTS

D.P.U. 19-140

Bay State Gas Company d/b/a Columbia Gas of Massachusetts ("Respondent" or "CMA") agrees to take the following actions within the specified time periods:

1. Revise the engineering plan and constructability review process across all CMA's Massachusetts' territories. This will ensure that all applicable departments review construction documents for accuracy and completeness. It will further confirm that the documents or plans be sealed by a professional engineer prior to commencing work.

2. Review and ensure that all records and documentation of CMA's natural gas systems are traceable, reliable, and complete.

3. Apply management of change process to all changes to adequately identify system threats that could result in a common mode failure.

4. Develop and implement control procedures during modifications to gas mains to mitigate the risks identified during management of change operations. Gas main pressures should be continually monitored during these modifications and assets should be placed at critical locations to immediately shut down the system if abnormal operations are detected.

5. Review protocols and training for responding to large-scale emergency events, including providing timely information to emergency responders, appropriately assigning CMA emergency response duties, performing multi-jurisdictional training exercises, and participating cooperatively with municipal emergency management agencies.

6. Review and verify that all plastic to steel transition fittings used in the reconstruction of Merrimack Valley comply with GS 1680.020 Plastic to Steel Transition Connections.

7. Review and verify that all services and mains installed during the reconstruction of Merrimack Valley have been pressure tested and documented per Federal and State requirements.

8. All Merrimack Valley reconstruction services or mains identified as not having pressure test documentation will be required to have a pressure test performed in accordance with 49 C.F.R. Part 192, §§ 192.511 and 192.513.

9. By September 30, 2020, CMA shall provide documentation to the Department to show it has complied with Items 1-8.

10. Within 210 days of the effective date of this Order, CMA shall create, for each regulator station, site-specific procedures for the maintenance of each pressure regulator required to be maintained.

KEEGAN WERLIN LLP

ATTORNEYS AT LAW

99 HIGH STREET, SUITE 2900

BOSTON, MASSACHUSETTS 02110

(617) 951-1400

TELECOPIER:

(617) 951-1354

September 25, 2020

VIA ELECTRONIC MAIL

Mark Marini, Secretary
Department of Public Utilities
One South Station, 5th Floor
Boston, MA 02110

Re: Bay State Gas Company d/b/a Columbia Gas of Massachusetts – D.P.U. 19-140
Compliance Agreement Consent Order Requirements (23), (24), (25), (26) and (27)

Dear Mr. Marini:

Pursuant to the Consent Order, and associated Compliance Agreement, dated August 14, 2020, between the Pipeline Safety Division (the "Division") of the Massachusetts Department of Public Utilities and Bay State Gas Company d/b/a Columbia Gas of Massachusetts ("CMA" or the "Company") in the above-captioned matter, the Company hereby provides the following responses to address the requirements of Items 1, 2, 3, 4, 5, 6, 7, 8, and 9 of the Consent Order. Also enclosed is the Company's Statement in Support of a Designation of Critical Energy Infrastructure Information.

Compliance Agreement Requirement (1)
Revise the engineering plan and constructability review process across all CMA's Massachusetts' territories. This will ensure that all applicable departments review construction documents for accuracy and completeness. It will further confirm that the documents or plans be sealed by a professional engineer prior to commencing work.

Response:

Compliance Order Item #1 reiterates the National Transportation Safety Board (NTSB) Recommendation number P-18-6, issued to NiSource as a result of the Merrimack Valley Incident. NiSource submitted letters to the NTSB on March 15, 2019, May 10, 2019, and July 15, 2019 (Attachment 19-140-1-5(a)) outlining progress made on actions taken in response to Recommendation P-18-6. The NTSB issued a July 22, 2019 letter to NiSource requesting additional information about this work. The July 29, 2019 NiSource letter to the NTSB (Attachment 19-140-1-5(c)) provides additional detail regarding the actions taken for this recommendation. The NTSB classified this Recommendation as "Closed – Acceptable Action" in its final action report, adopted on September 24, 2019 (Attachment 19-140-1-5(d)).

Compliance Agreement Requirement (2)
Review and ensure that all records and documentation of CMA's natural gas systems are traceable, reliable, and complete.

Response:

Compliance Order Item #2 reiterates the National Transportation Safety Board (NTSB) Recommendation number P-18-7, issued to NiSource as a result of the Merrimack Valley Incident. NiSource submitted letters to the NTSB on March 15, 2019, May 10, 2019, and July 15, 2019 (Attachment DPU 19-140-1-5(a)) which outlined the actions taken in response to Recommendation P-18-7. The NTSB classified this Recommendation as "Closed – Acceptable Action" in its July 22, 2019 letter to NiSource (Attachment DPU 19-140-1-5(b)).

As discussed in CMA's July 29, 2020 letter to the Department (Attachment 19-140-1-5(h)), the Company identified errors on isometric drawings that were completed as part of the work to address NTSB recommendation P-18-7. CMA completed an extensive isometric drawing review program. Attachment 19-140-1-5(i) is the Company's letter to the DPU concerning the completion of the isometric drawing correction project.

Compliance Agreement Requirement (3)
Apply management of change process to all changes to adequately identify system threats that could result in a common mode failure.

Response:

Compliance Order Item #3 reiterates the National Transportation Safety Board (NTSB) Recommendation number P-18-8, issued to NiSource as a result of the Merrimack Valley Incident. NiSource submitted letters to the NTSB on March 15, 2019, May 10, 2019, and July 15, 2019 (Attachment 19-140-1-5(a)) outlining progress made on actions taken in response to Recommendation P-18-8. The NTSB issued a July 22, 2019 letter to NiSource requesting additional information about this work. The July 29, 2019 NiSource letter to the NTSB (Attachment 19-140-1-5(c)) provides additional detail regarding the actions taken for this recommendation. The NTSB classified this Recommendation as "Closed – Acceptable Action" in its final action report, adopted on September 24, 2019 (Attachment 19-140-1-5(d)).

Compliance Agreement Requirement (4)
Develop and implement control procedures during modifications to gas mains to mitigate the risks identified during management of change operations. Gas main pressures should be continually monitored during these modifications and assets should be placed at critical locations to immediately shut down the system if abnormal operations are detected.

Response:

Compliance Order Item #4 reiterates the National Transportation Safety Board (NTSB) Recommendation number P-18-9, issued to NiSource as a result of the Merrimack Valley Incident. NiSource submitted letters to the NTSB on March 15, 2019, May 10, 2019, and July 15, 2019 (Attachment DPU 19-140-1-5(a)) which outlined the actions taken in response to Recommendation P-18-9. The NTSB classified this Recommendation as "Closed – Acceptable Action" in its July 22, 2019 letter to NiSource (Attachment 19-140-1-5(b).

Compliance Agreement Requirement (5)
Review protocols and training for responding to large-scale emergency events, including providing timely information to emergency responders, appropriately assigning CMA emergency response duties, performing multi-jurisdictional training exercises, and participating cooperatively with municipal emergency management agencies.

Response:

Compliance Order item #5 reiterates Recommendation P-18-9, Issued to NiSource in the September 24, 2019 NTSB report. Attachment 19-140-1-5(e) is NiSource's December 23, 2019 letter to the NTSB which outlines proposed actions to this additional recommendation. Attachment 19-140-1-5(f) is a response letter from NTSB dated April 10, 2020 describing the status of this Recommendation as "Open – Acceptable Response". NiSource submitted Attachment 19-140-1-5(g) to the NTSB on September 22, 2020, which outlines actions and requesting closure of this recommendation.

In addition to the information supplied to the NTSB, CMA executed an emergency response table top drill in Easthampton, MA on September 24, 2020. The drill included CMA employees from multiple departments including engineering, construction, and operations, as well as representation from Eversource Energy, the DPU, and the Easthampton Fire Department. The material prepared to conduct this drill is included as Attachment 19-140-1-5(j). CMA also leveraged its newly established ICS structure in response to a gas leak in Lawrence in late September 2019. After the September 2019 event, the Company conducted an emergency response after action review of, which identified opportunities to improve its emergency preparedness and response (as discussed in Section 5 of Attachment 19-140-1-5(k). In addition, select CMA employees have started to receive training on the Eversource Energy emergency response plan, including information on roles and responsibilities in the Eversource Incident Command Structure. On August 27, 2020, CMA and Eversource employees participated in a joint table top emergency exercise drill.

Priority 1 -3, 1 = Highest

Priority	Area of Focus	Type of Analysis or Investigation Performed	Estimated Time to Completion from Day 1	Type of Output or Work Product	Notes
3	Gas Supply	▪ Review of distribution system to identify supply needs given current supply portfolio. ▪ Assess system requirements and supply and demand forecast and balances. ▪ Analyze existing portfolio for diversity, flexibility, reliability, risk exposure, mismatch of supply entitlements vs. demands by areas including G Lateral. ▪ Review of upstream options (lateral expansion/pipeline expansion, contracts with other shippers holding capacity, etc.). ▪ Assess potential for environmental improvements through methane emission reduction, renewable natural gas, and hydrogen	12-15 months	Development of a unified supply plan for EGMA	▪ 2020/21 actual winter experience will be instructive to understand system operations and needs. ▪ May use consultants to support specific or overall strategic solutions.

D1

Priority 1 -3, 1 = Highest

Priority	Area of Focus	Type of Analysis or Investigation Performed	Estimated Time to Completion from Day 1	Type of Output or Work Product	Notes
2	LNG/LPG Facilities – *Supply Function*	▪ Study and evaluate opportunities to retire or refurbish existing facilities or utilize HOPCO assets. ▪ Assess interactions and synergies between Acushnet, Hopkinton and CMA system to address deficiencies. ▪ Review other on-system options (portable CNG/LNG, demand response, energy efficiency, and distribution system improvements). ▪ Given high dependency on LNG/LPG facilities for peak season, analysis shall consider interoperability, equipment placement and scheduling of work to ensure peak season availability and reliability.	12-15 months	Development of a unified supply plan for EGMA	May use consultants to support specific or overall strategic solutions.
2	LNG/LPG – *Compliance*	Assess compliance of facility documentation including maintenance program, training program, Fire Study and Protection Plan (FSPP), and overall compliance documentation	6-12 months	Assessments will be used to develop gap mitigation plan; improvement plan; and FSPP updates	Assessment will likely be outsourced; planning will be collaborative or internal.
2	LNG/LPG – *Operations and Maintenance (O&M)*	Assess/audit procedures, spare parts inventory, calibration and maintenance practices, corrosion (incl. tanks), system architecture documentation, equipment performance testing.	9-12 months	Assessments will be used to develop gap mitigation plan and improvement plan	Assessment will likely be outsourced; planning will be collaborative or internal.

D2

Priority 1 -3, 1 = Highest

Priority	Area of Focus	Type of Analysis or Investigation Performed	Estimated Time to Completion from Day 1	Type of Output or Work Product	Notes
3	LNG/LPG – *Electrical Hazard and Safety (EH&S)*	Assess and review hazards and safety aspects of the facilities including (a) environmental: asbestos, mercury, and (b) safety: electrical arc-flash, electrical hazardous area classifications, confined space, PPE Matrix, sound studies, etc.	6-12 months	Reports and analysis	Outsource to vendor
3	LNG/LPG – *Capital Investment*	▪ Leverage Safety & Reliability Assessment gas supply study data to advance a Front-End Engineering and Design (FEED) study incorporating all facility systems. ▪ In parallel, focus specifically on areas of short-term need, such as foundation heaters, boil-off gas, and instrumentation and control systems ▪ Given the high dependency on LNG/LPG facilities for peak season, analysis shall consider interoperability, equipment placement and scheduling of work to assure peak season availability and reliability.	6-12 months	"Next Step" Report providing increased depth of technical project development and schedule.	Outsource to vendor.

Priority 1 -3, 1 = Highest

Priority	Area of Focus	Type of Analysis or Investigation Performed	Estimated Time to Completion from Day 1	Type of Output or Work Product	Notes
1	Gate Stations & District Regulators	▪ Assess safety, security and condition of all Gate Stations and District Regulators through field site visits and a review of operating and maintenance history records. ▪ Assess and validate slam-shut device installations & configurations on low-pressure District Regulators ▪ Review current system for inclusion into Gas System Modernization plans (e.g., enhanced telemetry and SCADA control).	6-9 months	Assessments of stations will be used to risk-rank locations and develop mitigation programs. Stations will be prioritized for repair or replacement.	Outsource to vendor.
3	High Pressure Pipelines	Assess pipelines operating above 100 psi, including a review of high-pressure services, leak history, cathodic protection systems, cathodic protection surveys and testing, previous compliance items and commitments made for improvements. Issues of possible high-pressure system concerns/risks will consider leak data associated with DIMP, as well as other factors.	6-9 months	▪ Assessment will be used to risk-rank pipelines, develop and implement mitigation programs, and identify any potential compliance issue. ▪ Assessment will identify any additional CP surveys (e.g., Close Interval Surveys) to verify levels of CP for these assets.	Internal resources.

D4

Priority 1 -3, 1 = Highest

Priority	Area of Focus	Type of Analysis or Investigation Performed	Estimated Time to Completion from Day 1	Type of Output or Work Product	Notes
1 DIMP 3 TIMP	DIMP/TIMP Transition and Integration	▪ Assess DIMP and TIMP and develop transition and integration plans. Assess overall risk and asset-management programs and effectiveness ▪ DIMP leak survey trending analysis by: (1) grade; (2) pipe type (main/service lines); (3) material; (4) leak cause; and (5) by town. This information will be used to assist replacement project decisions, including decisions to move inhouse regulators outside.	6-9 months	▪ Roadmap to integrate DIMP plan into Eversource program. ▪ Outline and scope of new TIMP plan appropriate for size and scale of transmission facilities ▪ Develop additional and enhanced mitigation action plans to address issues. ▪ Align risk and asset management practices to Eversource	Outsourced to vendor.
1	GSEP	▪ Evaluate GSEP program, effectiveness of leak reduction and pace. ▪ Review project selection process and pipe-segment prioritization tools. ▪ DIMP leak survey trending analysis by: (1) grade; (2) pipe type (main/service lines); (3) material; (4) leak cause; and (5) by town. This information will assist replacement project decisions and prioritization. Primary efforts should focus on reducing grade 1 leaks.	6-9 months	Identification of necessary changes in 2022 and long-term GSEP program to reduce overall system leakage, ensure quality construction and achieve original 20-year schedule.	May use consultants to support specific or overall strategic solutions.

Priority 1 -3, 1 = Highest

Priority	Area of Focus	Type of Analysis or Investigation Performed	Estimated Time to Completion from Day 1	Type of Output or Work Product	Notes
3	Leaks on Non-Legacy Materials	▪ Investigate leaks and failures on state-of-the-art facilities. ▪ Evaluate cathodic protection systems.	6-8 months	▪ Summary of causes and locations (facility type) of leaks and failures. ▪ Recommendation for mitigation plan.	Outsource to vendor.
3	Pipeline Safety Management System	Perform gap analysis, audits, identify and assess PSMS programs and effectiveness.	12-15 months	Will identify mitigation plans and actions required, organized by program, as well as gaps to address for each program, in order to transition to a single common PSMS program for Eversource.	Outsource to vendor.
2	Gas Process Safety	▪ Review current investigation and incident analysis process. ▪ Develop plan to implement Taproot (root cause analysis) training. ▪ Assess the understanding and application of Process Safety concepts in planning, design, and execution of work.	9-12 months	▪ Taproot training, implementation and rollout. ▪ Process Safety training and workforce engagement. ▪ Safety Engagement Team structure and hazard ID.	Internal resources.

D6

Priority 1 -3, 1 = Highest

Priority	Area of Focus	Type of Analysis or Investigation Performed	Estimated Time to Completion from Day 1	Type of Output or Work Product	Notes
1 on LP	System Reliability	▪ Assess overall CMA distribution system to improve system reliability and resiliency. ▪ Evaluate resiliency projects that improve the system's ability to adapt to changing conditions, withstand threats, and quickly recover from incidents by increasing system redundancy and to better able to maintain service under supply curtailments. ▪ Evaluate and track low-pressure systems for conversion to higher pressure to improve reliability. Review of single-feed systems to evaluate potential to create multiple feeds to improve reliability.	9-12 months	Development of projects to improve system reliability and resiliency to improve overall safety and reliability of the system.	Internal resources.
1	Enhanced Leak Survey & Preventative Maintenance	▪ Review and analyze leak report and integrity assessment result for potential increases to leak survey frequency. ▪ Consider additional preventative maintenance activities on key assets to ensure safety and reliability until capital investments have been made. ▪ Consider utilization of advanced leak detection technologies. ▪ Special attention should be given to leak frequency and grading and identification of pipeline areas that may warrant more frequent leak surveys	6-9 months	▪ Plan for increasing leak survey frequency. ▪ Update preventative maintenance plan for key assets.	Internal resources.

Priority 1 -3, 1 = Highest

Priority	Area of Focus	Type of Analysis or Investigation Performed	Estimated Time to Completion from Day 1	Type of Output or Work Product	Notes
3	Enhanced Quality Control & Contractor Onboarding	▪ Assess contractor oversight using TRC and internal subject matter experts and existing terms & conditions regarding contractor training/quality. ▪ Assess and implement Quality Management (QM) program for all contractor and internal crews including Quality Control and Quality Assurance, with focus on field audits, including re-dig audits, to validate compliance, using internal FTEs and third-party Quality Management personnel.	6 months	Enhanced management oversight plan, delineating investment in existing and additional personnel and QM activity focused on all activities (capital, O&M, LNG, I&R).	▪ Rollout will require robust presence to reinforce the zero-defect culture. ▪ Deployment of complete QM program will take 12 months.
3	Workmanship & QA/QC	▪ Evaluate prior workmanship and QA/QC processes that may impact system performance, reliability and safety. ▪ Evaluate replace or repair as a remedy.	12-15 months	Data and information to inform replace or repair remedies	Internal Resources.
3	Enhanced Operator Qualification	Review current qualifications to transition CMA workforce to Eversource OQ Program.	6-9 months	Development of plan to transition CMA workforce to Eversource OQ Program	Eversource with support from TRC

D8

Priority 1 -3, 1 = Highest

Priority	Area of Focus	Type of Analysis or Investigation Performed	Estimated Time to Completion from Day 1	Type of Output or Work Product	Notes
3	Training and Development Programs	▪ Assess training and development programs and alignment to business needs. ▪ Assess apprentice and new employee programs developed to advance employees to required competencies. ▪ Assess refresher training to maintain skill and competence of existing workforce. ▪ Assess professional and engineering development programs.	9-12 Months	▪ Enhanced training and development programs. ▪ Develop robust training program to transition workforce to Eversource operating and emergency response procedures.	May use consultants to support specific or overall strategic solutions.
1	Maps and Records	▪ Assess CMA maps and records to assure completeness, consistency, and accuracy; availability to field crews; and updating & maintenance according to process. ▪ Identify issues that may impact Eversource commitment to reliability, including dig-ins, unplanned outages, maintenance and asset management. ▪ Validate completion of NTSB recommendation related to maps & records. ▪ Review GIS system and access/accuracy of information in the system. ▪ Assess potential for incorporating leak data in GIS, including incremental value as compared to other systems, cost, timeline, and system benefit.	6-9 months	▪ Identify areas of weakness, risks, and concern. ▪ Develop short-term and long-term strategies to eliminate gaps to the extent possible and/or mitigate risk of gaps.	Eversource with support from TRC

Priority 1 -3, 1 = Highest

Priority	Area of Focus	Type of Analysis or Investigation Performed	Estimated Time to Completion from Day 1	Type of Output or Work Product	Notes
3	Data Integrity	Evaluate data quality and integrity and its impact on information technology systems to operate distribution facilities and deliver service to customers	10-12 months	Identify data flaws and deficiencies to create remedial plan.	May use consultants to support specific or overall strategic solutions.
3	Gas Operations Tooling and Safety Equipment	Review and assess tooling and safety equipment in the field to align, upgrade or replace. Assess process for control of maintenance and calibration of tools and safety equipment.	6-9 months	Develop program for improved safety with respect to customers and employees.	Internal Resources.
3	Meters	▪ Assess customer meters (review meter protection backlog and atmospheric corrosion inspection and mitigation backlogs, review in-to-out meter strategy). ▪ Assess new technology (e.g., smart metering) ▪ Assess opportunities for accelerated effort to move meter sets out of buildings that are not part of pipe replacement.	6-9 months	Identify highest risks and adjust mitigation plans as needed.	May use consultants to support specific or overall strategic solutions.

Priority 1 -3, 1 = Highest

Priority	Area of Focus	Type of Analysis or Investigation Performed	Estimated Time to Completion from Day 1	Type of Output or Work Product	Notes
3	**Compliance Work Backlog**	▪ Review and compile a list of compliance work, AOCs, and other regulatory obligations. ▪ Determine age profile and develop a plan for completing work on an appropriate schedule. ▪ Develop prioritization of tasks included in Compliance Agreement and action items set forth in D.P.U. 19-140.	9-12 months	Complete a specified work plan with definitive targets to become current.	Internal resources.

Priority 1 -3, 1 = Highest

Priority	Area of Focus	Type of Analysis or Investigation Performed	Estimated Time to Completion from Day 1	Type of Output or Work Product	Notes
2	**Procedures and Standards, NTSB Recs.**	▪ Review and comparison of NiSource procedures and standards to Eversource counterpart. ▪ Review of work design, constructability reviews/approvals, PE certification, live gas procedures/drawings, work execution and close-out. ▪ Validation that NTSB recommendations are addressed. ▪ Assess whether management of change covers any field equipment changes not a "replacement in kind" with escalating team process/management review and multiple management signoff even if a PE stamp is not necessary. ▪ Assess whether MOC procedures contain prescriptive and clear requirements in the MOC beyond the NTSB recommendations.	6-9 months	▪ Report of differences by procedure/process to indicate focus for training and qualification of CMA personnel. ▪ Will be used to map and focus the transition of CMA personnel to Eversource procedures and standards, methods, and Operator Qualification. ▪ MOC procedures with clear and prescriptive requirements. Requirements will cover field equipment changes not a "replacement in kind" with escalating team process and management review and multiple management signoff even if PE stamp is unnecessary.	▪ Eversource with support from TRC. ▪ Priority for MOC procedures modification as the main issue is the completeness of the MOC procedures to include prescriptive enhancement. ▪ Create a MOC procedure that goes well beyond the NTSB recommendations. The MOC process must be clear, detailed, and prescriptive.
3	**Dynamic Risk Recs.**	Review Dynamic Risk recommendations, current action plans and status. Assess action plans.	6-9 months	Identify necessary adjustments to action plans and recommend new or modified action plans as necessary.	Internal resources.

Priority 1 -3, 1 = Highest

Priority	Area of Focus	Type of Analysis or Investigation Performed	Estimated Time to Completion from Day 1	Type of Output or Work Product	Notes
3	Emergency Response Program	Review existing Emergency Response Program including, ERP development/maintenance, incident management strategies and structure, and reporting/documentation practices; standardized emergency response procedures and frontline operating practices; Training and Exercise Program; Critical Facilities/Emergency Operations Center(s); Emergency supplies/resources; IT Tools/Information Management Systems; Community outreach and training; and status of implementation/incorporation of NTSB Improvement recommendations.	6-9 months	▪ Validate critical operation concepts (i.e. incident escalation/response activation procedures). ▪ Determine functionality of critical IT systems and CMA staff proficiencies. ▪ Identify available resources and supplies and status of community outreach efforts. ▪ Ensure critical infrastructure supports expanded ICS/ERP activations. ▪ Determine NTSB Corrective Action Review process and Improvement Planning progress. ▪ Incorporate/clarify the role of Gas Control in the event of a pipeline emergency.	May use consultants to support specific or overall strategic solutions.
3	SCADA & Gas Control	Assess system, workforce needs to transition to EGMA SCADA and Gas Control involvement in live gas work (field work coordination, authorization of tasks affecting the flow of gas).	6-9 months	Develop plan to incorporate live gas work needs into transition of Gas Control & SCADA to EGMA system.	May use consultants to support specific or overall strategic solutions.

Appendix E

ALERT REPORT

June 30, 2020

FROM: **James E. Hall**
Court-Appointed Monitor for Columbia Gas of Massachusetts (CMA)

TO: The Government Committee:
Neil Gallagher; Assistant U.S. Attorney; District of Massachusetts
Richard Enright; Massachusetts Department of Public Utilities
Rebecca Tepper; Massachusetts Attorney General's Office

In accordance with Section 5.6 of the Work Plan from the Court-Appointed Monitor[1] for Columbia Gas of Massachusetts (CMA), this notice is to *"alert the Committee immediately upon the observation of any safety-related concern that the Monitor deems to be an actual or potentially significant hazard…"*

On Friday, June 26, a representative of CMA's parent company, NiSource, verbally notified the Monitor Team Lead of the discovery of inaccurate, unsigned and undated drawings of regulator stations within CMA. The issue was reportedly found by a CMA contractor who was referring to a drawing with errors while developing written procedures. NiSource subsequently sampled 7 other drawings and found errors in all of them. As a result, NiSource immediately issued an "Operational Notice" that day, and conducted "safety stand downs". NiSource reportedly informed the Assistant U.S. Attorney, the Probation Office, the Massachusetts Division of Public Utilities (DPU), and it has reached out to the National Transportation Safety Board (NTSB). NiSource also reportedly intends to sample additional drawings in other states, conduct an "Extent of Cause" review and develop a corrective action plan.

Given the Monitor's court-appointed requirements, we have requested records and documents associated with this issue, including a copy of the "Operational Notice" issued on June 26 and any other documents regarding: who discovered the issue; when and how was it discovered; which drawings were found to be inaccurate or incomplete; what actions were taken upon discovery; whether external government entities were notified and by what means; and any go-forward plans to pursue the investigation and resolution.

While the Monitor has not determined the potential severity of this safety-related condition associated with these improperly prepared drawings, we are nonetheless issuing this alert to the Committee with an abundance of caution to further the intent of the Monitor's Work Plan. The deficiency of incomplete documentation and mapping arose during the NTSB's investigation into the Merrimack Valley accident in September 2018, and again in a release of natural gas one year later. As a result of the Merrimack investigation, the NTSB issued recommendation no. P-18-007 which recommends that NiSource *"Review and ensure that all records and documentation of your natural gas systems are traceable, reliable, and complete."* The NTSB classified this recommendation as "Closed-Acceptable Action" in July 2019 based on NiSource correspondence and meetings.[2]

[1] In *United States v. Bay State Gas Company, d/b/a Columbia Gas of Massachusetts,* a Plea Agreement was entered that requires a monitor to report monthly in writing to a government committee ("Committee") composed of a representative from the U.S. Attorney's Office, the DPU, and the Massachusetts Attorney General's Office during a three-year probation period, or until CMA's assets are sold by NiSource. The Plea Agreement requires CMA to employ at its expense an independent monitor to oversee its compliance with five NTSB recommendations issued from its Merrimack Valley investigation -- and also to monitor compliance with the "applicable laws and regulations" related to the issues addressed in the recommendations. The Monitor Agreement that ensued required the development of a "Work Plan" which was finalized and submitted on June 26, 2020.

[2] In its May 2019 response to the NTSB for this recommendation, NiSource stated that it had "completed locating, marking and mapping of control (regulator-sensing) lines at all 2.072 low-pressure regulator runs across its seven-state footprint."

Appendix F

Persons Interviewed by the Monitor

	Company	Position Held	No. of Times
1.	CMA	EVP Chief Legal Officer & CMA CEO	6
2.	NiSource	EVP, COO & President NiSource Utilities	
3.	CMA	Director Field Operations	
4.	NiSource	SVP & Chief Safety Officer	
5.	NiSource	CEO	
6.	NiSource	VP Safety Management & Engineering	3
7.	CMA	Director Construction	
8.	NiSource	VP, Construction & Engineering Services	
9.	CMA	Manager Operations Center, Lawrence	3
10.	CMA	VP & General Manager	2
11.	CMA	Director Safety, Compliance, Risk	5
12.	CMA	President & COO	
13.	CMA	COO effective 8/1	9
14.	CMA	State SMS Lead	
15.	CMA	State SMS Lead	
16.	CMA	Manager Environmental Health & Safety	
17.	NiSource	Director Environmental Health & Safety	
18.	CMA	Lawrence Construction Coordinator	
19.	CMA	Brockton Local 273 President, Welder	
20.	CMA	Brockton Inspector	
21.	CMA	Brockton Service E.R. Dept	
22.	CMA	Manager Technical Training	
23.	CMA	Manager Public Awareness/Damage Prevention	
24.	CMA	Operations Center Manager, Springfield	
25.	CMA	Systems Operations Manager	
26.	CMA	Lead Fitter, Distribution	
27.	CMA	Service Technician A, Customer Service	
28.	CMA	Lead Distribution Operator, Distribution	
29.	CMA	Inspector, Construction	
30.	CMA	Field Operations Administrator, Distribution	
31.	CMA	Revenue Recovery Rep, Revenue Recovery	
32.	CMA	Sr Universal Customer Rep, Call Center	
33.	CMA	Field Operations Administrator, Distribution	
34.	CMA	Field Crews, Springfield	
35.	NiSource	Director Gas Emergency Preparedness & Response	
36.	NiSource	Manager Emergency Preparedness & Response	2
37.	NiSource	Manager Emergency Preparedness & Response	2
38.	CMA	Leader Field Operations, Lawrence	
39.	CMA	M&R Maintenance Mechanic, Lawrence	
40.	NiSource	Manager Emergency Preparedness & Response	
41.	NiSource	Manager Emergency Preparedness & Response	
42.	NiSource	VP Ops Integration & Emergency Management	
43.	NiSource	DIMP Manager	
44.	CMA	Manager Operations Compliance	
45.	Steelworkers	President, Steelworkers Local 12026	3
46.	IBEW	Business Manager IBEW Local	
47.	Utility Workers	Business Manager Utility Workers Local 273	
48.	DPU	Director, Pipeline Safety Division	3

Site Visit/Observations Completed by the Monitor

1. **CMA Training Center -** Shrewsbury - August 14, 2020
   Safety Town; Virtual Training Simulators; Hands-on Labs and Demo Areas, Fire Safety Training Area
2. **CMA Springfield Operations Center** – Springfield -- August 26, 2020
3. **Leak Repair Project** – Springfield -- August 26, 2020
4. **Service Installation Project** – Springfield -- August 26, 2020
5. **CMA Mobile Command Center** - Springfield -– August 26, 2020
6. **CMA Temporary Office in the Merrimack Valley** – Methuen - September 10, 2020
7. **CMA Lawrence Operations Center** - Lawrence -- September 10, 2020
8. **Oak Street Regulator Station** – Methuen -- September 10, 2020
9. **NiSource Emergency Preparedness & Response Functional Exercise** - August 25, 2020
10. **CMA Tabletop Exercise** -- September 24, 2020